

THE US EXPERIENCE WITH TACTICAL NUCLEAR WEAPONS: LESSONS FOR SOUTH ASIA

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Soon after its 1998 nuclear tests, the primary focus of Pakistan's nuclear establishment shifted from research and development to fielding a fully operational nuclear force. The Strategic Plans Division of the Joint Staff Headquarters was set up in February 2000 to oversee the further development and eventual employment of the country's nuclear weapons and delivery systems, and to act as the secretariat of the National Command Authority. For nearly a decade afterward, the consistent "nuclear narrative" by the SPD and others of the Pakistan's national security intelligentsia was that Pakistan aimed to have only enough weapons for "credible minimal deterrence" because the country had neither the resources nor inclination to engage in a nuclear arms race with India.¹ However, in the last few years this modest nuclear aim appears to have changed as Pakistan has become the world's fastest growing nuclear state. From a currently estimated inventory of approximately 100 nuclear weapons, Pakistan appears to be building between 12 to 15 nuclear warheads a year and may be on track to double if not triple this total within a decade as it brings on line additional plutonium production reactors at its Khushab nuclear complex.² Perhaps even more disturbing is that many of these new

¹ There is of course much more to Pakistan's nuclear narrative than these two points. The narrative amplifies what Michael Krepon describes as the four main pillars of Pakistan's nuclear doctrine: that it is India-specific, aims for minimum credible deterrence, that it may be subject to future Indian decisions such as the deployment of an anti-ballistic missile system, and that Pakistan does not wish to engage in a costly nuclear arms race with India. Other parts of the narrative are that the US-Soviet Union experience in the Cold War is not a good model to understand the nuclear dynamic in South Asia, that Pakistani nuclear "redlines" are best left ambiguous, that there will be "reasonable transparency" about Pakistan's nuclear program to assuage western concerns, and that Pakistan—as the smaller and more vulnerable state—will always reserve the right to use nuclear weapons first in any future conflict with India. See Michael Krepon, "Pakistan's Nuclear Strategy and Deterrence Stability", Unpublished paper, July 2012.

² Karen DeYoung, "New Estimates Put Pakistan's Nuclear Arsenal at More than 100," Washington Post, January 31, 2011 and Shaun Gregory, "Terrorist Tactics in Pakistan Threaten Nuclear Safety", CTC Journal, June 2011, Vol. 4, Issue 6, pg 4.

warheads are probably intended for a variety of short range nuclear systems currently under development. Such systems are commonly referred to as tactical nuclear weapons.³

The pace of development of tactical nuclear weapon delivery systems by India as well as Pakistan has dramatically accelerated in the past two and a half years. On 19 April 2011 Pakistan tested the *Nasr (Hatf-IX)* short range ballistic missile. According to the Inter-Services Public Relations press release issued the same day, “The missile has been developed to add deterrence value to Pakistan’s Strategic Weapons Development program at shorter ranges. *Nasr*, with a range of 60 km, carries nuclear warheads of appropriate yield with high accuracy, shoot and scoot attributes. This quick response system addresses the need to deter evolving threats.”⁴ A Pakistani observer, Mansoor Ahmed, quickly noted the *Nasr* test “demonstrated that Pakistan has succeeded in miniaturizing its nuclear weapon designs to the extent that these can be launched by tactical and cruise missiles...Pakistan can now make air and naval versions of *Nasr* and nuclear tip the *Babar* and *Ra’ad* cruise missiles.”⁵ Soon afterward, on 21 July, India conducted the first test firing of its own tactical ballistic missile system, the 150 km range *Prahaar*, which according to Indian press accounts carries a 200 kg conventional warhead and can be fired in salvos of six independently targeted missiles.⁶ Though not expressly stated to be a nuclear delivery system, it could carry a small nuclear warhead should India decide to match the Pakistani capability. Since March 2012, Pakistan has tested no less than four

³ The terms “short range nuclear system”, “battlefield nuclear weapon”, “non-strategic nuclear weapon”, and “tactical nuclear weapon” are often used interchangeably. The definition of what is or is not a tactical nuclear weapon is a thorny one and was often defined differently by the United States and the Soviet Union in arms control negotiations. Any answer cannot be based solely on the yield of the warhead or range of an associated delivery system, but must include the perceived effect on one of the opponents in a conflict. This issue is addressed in more detail below.

⁴ Press Release, 19 April 2011, Directorate for Inter Services Public Relations. Available at http://www.ispr.gov.pk/front/main.asp?o=t-press_release&id=1721.

⁵ Ahmed, Mansoor, “Why Pakistan needs tactical nuclear weapons,” *The Weekly Pulse*, 6 May 2011. Available at www.weeklypulse.org/details.aspx?contentID=563&storylist=9. Ahmed is correct. Once the basic miniaturization process is mastered, it is relatively easy to make small warheads for a variety of land-based systems, artillery shells for example, or naval systems like torpedoes and ship-to-ship missiles as well.

⁶ *The Hindu*, 21 July 2011. Available at www.thehindu.com/news/national/article2279166.ece.

relatively short range missile systems—the 180 km range *Abdali*, the 750 km range *Shaheen 1-A*, the 290 km range *Ghaznavi*, and the 60 km range *Nasr*—and two cruise missiles, the 350 km range air launched *Ra'ad* and the 700 km range ground or sea launched *Babur*. Additionally, the Pakistan Navy inaugurated its Navy Strategic Forces Command on 19 May. The ISPR press release noted that the new command would be the custodian of the nation's "second strike capability"⁷ although the Pakistan Navy had not previously been considered to have a nuclear delivery capability. India also tested two short range systems in the same time period: the 290 km range *Brahmos* cruise missile and the 700 km range *Agni-1*. Following the *Agni* test, V.K. Saraswat, Scientific Advisor to the Defence Minister announced that the first test of the *Nirbay*, India's equivalent to the US Tomahawk land attack cruise missile would be tested in August 2012.⁸

So what are the implications for nuclear stability in South Asia if the development, refinement, and deployment of such systems continues apace? Unfortunately, the United States and NATO and the Soviet Union have walked this ground before. Based on four decades of experience with the development and employment of tactical nuclear weapons during the Cold War we can probably expect to see three unsettling developments: (1) the development and deployment of new systems will precede the development of doctrines for their employment; (2) India will match (and perhaps even exceed) whatever numbers of weapons Pakistan eventually builds; and (3) the numbers of deployable weapons may be limited only by the fissile material production capacity on both sides rather than the number perceived to be needed for deterrence.

⁷ ISPR Press Release No. 122/2012, "Naval Chief Inaugurates Naval Strategic Force Headquarters", 19 May 2012.. Available at <http://www.defence.pk/forums/pakistan-navy/180815-naval-chief-inaugurates-naval-strategic-force-headquarters.html#ixzz20v0lzfji>.

⁸ *The Hindu*, 13 July 2012, "Agni-1 a Success". Available at <http://www.thehindu.com/sci-tech/science/article3634634.ece?homepage=true>. Although the system has not yet been tested, as of September 2012, the Indian media was still reporting the test as being expected "shortly". See <http://www.teluguone.com/news/content/technology-33-17564.html>.

In considering this dismal situation, I was reminded of the philosopher, George Santayana, who in 1905 famously wrote, “Those who cannot remember the past are condemned to repeat it”. Since Pakistan at present—and possibly India in the future—seems intent on developing platforms for tactical nuclear weapons, the lessons of the Cold War ought to be carefully studied by Pakistani national security analysts and military leaders. Unfortunately, another part of Pakistan’s nuclear narrative is that the Cold War experience of the US and the Soviet Union and the lessons it generated have little applicability to South Asia because the geopolitical context is so dissimilar.⁹ I cannot disagree more. It is precisely these differences that make the looming nuclear environment in South Asia, if anything, even more dangerous than the Cold War. Whether or not its leaders choose to ignore these lessons, Pakistan’s decision to embrace tactical nuclear weaponry will ultimately require it to deal with the doctrinal implications, increased security and command and control requirements, and the potentially destabilizing implications of deploying such weapons.

Therefore, this chapter will briefly review the history of the US and NATO deployment of tactical nuclear weapons, identify the principal lessons learned about their management and employment, and review the current positions of the United States, Russia, and India about their utility. Next, the Pakistani argument for their efficacy will be considered, as will the similarities and differences between the Cold War experience and the present environment in South Asia. Finally, the lessons the US and NATO learned at such a high cost considered relevant to Pakistan will be discussed. While the principal focus of this paper is on Pakistan, these lessons would be equally applicable to India if it chooses to emulate Pakistan’s current trajectory.

⁹ Statement made by Lt Gen (ret) Kidwai during a presentation on 25 October 2006 at a Washington, D.C. think tank.

The US and NATO Experience with Tactical Nuclear Weapons

This section will focus primarily on the US Army's fifteen year struggle to devise a practical doctrine and force structure for the employment of tactical nuclear weapons in land warfare. This approach was chosen because of the similarity between the dilemma confronting the United States in Europe during the Cold War and that faced today by the Pakistan Army on its eastern border: finding a way to deter an opponent possessing an overwhelming conventional military advantage. The need for such a doctrine and force structure was not as great in other American theaters of operation during this time because the geopolitical context was much different. In Korea and Japan, for example, the overwhelming naval superiority of the United States could be brought to bear more quickly and easily in a relatively narrow peninsula or the Japanese islands than deep in central Europe. Like Europe during the Cold War, South Asia is predominantly a continental theater where India has the ground force advantage and Pakistan, as the United States did in the 1950s, sees tactical nuclear weapons as a force equalizer.¹⁰

The 1940s: Nuclear Monopoly and Strategic Deterrence

The first American nuclear weapons were massive in size and weight and the only feasible method of delivering them was by heavy bombers, a mission tailor-made for the soon-to-be-independent US Air Force.¹¹ In October 1945, the Joint Chiefs of Staffs, in their first study

¹⁰ Elbridge Colbert notes three key strategic differences between Europe and the Far East in the Cold War: (1) there was a unitary alliance (NATO) in Europe while the US had to deal simultaneously with many governments in Asia due to the "hub and spoke" nature of the US strategic architecture in Asia; (2) there was more freedom of action to deploy nuclear weapons as neither Japan nor Korea required a dual-key approach; and (3) Asia was a naval theater where the USN had an overwhelming conventional advantage. See Colby, Elbridge A., "US Nuclear Weapons Policy and Policymaking: The Asian Experience", in Nichols, Tom, Douglas Stuart and Jeffrey D. McCausland (eds), Tactical Nuclear Weapons and NATO, (Carlisle PA: US Army Strategic Studies Institute), 2012, pp. 75-105.

¹¹ From June 1941 until September 1947 when it was designated an independent service by the National Security Act of 1947, the US Army Air Forces functioned as a de facto independent service. Though nominally falling under

of the subject, concluded “The atomic bomb...will be primarily a strategic weapon of destruction against concentrated industrial areas vital to the war effort of the enemy nation....On the other hand, the atomic bomb is not in general a tactical weapon suitable for employment against ground forces...because they normally offer targets too widely dispersed to justify the use of a weapon of such limited availability and great cost.”¹² With the US monopoly expected to endure for several years, little thought was given to any use other than for strategic purposes, but the unanticipated end of that monopoly in 1949 stimulated other thinking. Soon there were two distinct streams of thought about future nuclear weapons development: the “super”, promoted by scientists like Edward Teller who wanted to build thermonuclear fusion weapons, and the “little bomb” advocates, led by Robert Oppenheimer and others who were unconvinced about the technical feasibility of thermonuclear weapons and saw more practical utility in smaller fission weapons. Teller’s view prevailed but, in due course, Oppenheimer’s recommendations for lower-yield nuclear weapons also were implemented although the Truman administration focused mainly on the “super.” Vannevar Bush, who as head of Office of Scientific Research and Development helped develop the Manhattan Project, and who was a key scientific advisor to President Truman after WWII, expressed the prevailing wisdom when he opined, “There will be no shells for guns carrying atomic explosives, nor will they be carried by marine torpedoes or small rockets or in any other retail way. Atomic bombs will be used only against important targets to which it pays to devote a large effort.”¹³

This attitude was echoed in the US military establishment. Shortly after Bush’s statement, then Chief, Armed Forces Special Weapons Project, Brigadier General Herbert Loper, trenchantly observed: “Show me how to use this weapon tactically. It is not a tactical

the US Army, its head during most of this period, General Henry H. Arnold, served as a full member of the US Joint Chiefs of Staff.

¹² Midgely, John J., Deadly Illusion: Army policy for the Nuclear Battlefield, (Boulder CO: Westview Press), 1986.

¹³ Van Cleave, William R. and Cohen, S.T., Tactical Nuclear Weapons: An Examination of the Issues. (New York: Crane, Russak, and Company), 1978, pp 3-4.

weapon.”¹⁴ The Chairman of the Joint Chiefs of Staff, General Omar Bradley, put the military’s view before a much wider audience in a Saturday Evening Post article in October 1949: “This train of thought represents so much compound folly that it is hard to answer patiently....It foolishly assumes that the atom bomb is omnipotent. It fails to explain how, if some millions of invader troops moved into Western Europe and were living off the country, we could use the bomb against them without killing ten friends for every enemy foe.”¹⁵

Despite this high level military ambivalence about the utility of nuclear weapons in a tactical role, and the complete absence of doctrine for their use, the Army continued to work on two potential nuclear delivery systems conceived during the latter stages of WWII. This was no doubt an attempt, during a postwar period of military austerity, not to be seen as irrelevant in comparison to the newly independent US Air Force which seemed to have a lock on the prestigious nuclear delivery mission. Begun in 1944, the 75-mile range Corporal missile was first launched by an all-military crew in 1947 and approved as the Army’s first nuclear delivery system in December 1950. And no doubt to the dismay of Vannevar Bush, a 280mm artillery system begun in November 1949 fired its first conventional artillery round in 1951 and the world’s first nuclear artillery projectile in May 1953. Work on a shorter range surface-to-surface missile, initially with a range of only 15 miles, the Honest John, began in 1950, entered full scale development in August 1951, and was certified for troop issue in 1954. In what would become a familiar pattern, lacking both a requirement and doctrine for their use, these and other new systems were simply added to the Army’s existing force structure.¹⁶

¹⁴ Reinhardt, G.C., *Nuclear Weapons and limited Warfare: A Sketchbook History*, November 1964, pg. 4. Available at <http://www.rand.org/pubs/papers/2008/P3011.pdf>.

¹⁵ Quoted in Bracken, Paul, *The Command and Control of Nuclear Forces*, (New Haven CT: Yale University Press), 1983, pg. 137.

¹⁶ Midgely, pp 13-14.

The 1950s: Eisenhower's "New Look"

Two events in the early 1950s dramatically altered the US military's view of tactical nuclear weapons and ended any ambivalence about them in senior leadership circles. In early 1951, the three service secretaries jointly commissioned an assessment of the implications of nuclear weapons on the defense of Europe. The study was conducted by a mixed team of military experts and civilian scientists from the California Institute of Technology. Its report—codenamed VISTA because the work was done at the Vista del Arroyo Hotel in Pasadena—concluded that tactical nuclear weapons would be a more effective way to stop Soviet armies than strategic bombing. The Air Force strongly opposed this conclusion and tried unsuccessfully first to modify the report and then to suppress it entirely. The VISTA report also determined the Army had not fully assessed its vulnerability to nuclear fires and that its existing force structure was inadequate for the nuclear task. Particularly damning was the absence of knowledge about nuclear effects or the ability of soldiers to function in a nuclear environment. The study also noted that while the Army was well along in the fielding of its three nuclear-capable delivery systems, it had virtually no ability to acquire targets for them.¹⁷

The second major event was the election of President Dwight D. Eisenhower, whose national security team in October 1953 promulgated NSC 162/2, the Basic National Security Policy, popularly known as the "New Look". The New Look was decidedly favorable to the battlefield use of nuclear weapons: "The present policies will gradually involve the use of atomic weapons and conventional weapons for tactical purposes."¹⁸ The idea was to substitute cheaper nuclear weapons for expensive Army force structure in Europe. Consequently, the Army budget was to be reduced by 38 percent and its end strength slashed by one-third from 1.5 million to one million soldiers. If the Army wished to remain a relevant instrument of

¹⁷ Elliot, David C., "Project Vista and Nuclear Weapons in Europe", *International Security*, Vol. 11, No. 1 (Summer 1986), pg 163 and Midgely, p 22.

¹⁸ Van Cleave and Cohen, pg 4.

military power—and protect its remaining budget and manpower—it needed to get on board the nuclear train and embrace the battlefield use of nuclear weapons.

On 28 December 1953, only five days after Defense Secretary “Charlie” Wilson approved the JCS plan to implement NSC 162, the Army’s Chief of Staff, General Matthew Ridgway, ordered the Chief of Army Field Forces to prepare a long-range study of the future organization of the Army in this new environment. Within weeks, the Army War College and the Army’s Command and General Staff College began independent assessments of the problem, the former focusing on the nature of future warfare while the latter focused on the implications for Army force structure. They ultimately reached dramatically different conclusions which have not been fully resolved to this day. The War College study concluded the Army’s existing force structure and doctrine were totally inadequate for a nuclear battlefield. It recommended a radically different force design in which ground maneuver units would have only three functions: conduct reconnaissance and screening missions to develop targets for nuclear missiles, locate and destroy enemy nuclear and chemical weapons, and provide local security for command posts and guided missile units. In sharp contrast, the Command and General Staff College adopted the view that nuclear and conventional battlefields were essentially the same; the problem was only how best to adapt tactical nuclear weapons to the existing Army force structure.¹⁹

Faced with reconciling these two sharply divergent views, the JCS approved a series of exercises to evaluate the existing force structure and a new hybrid force design, the Atomic Field Test Army, or AFTA. After two inconclusive exercises in February 1955, Follow Me and Blue Bolt, NATO conducted a major exercise in June, Operation Carte Blanche, to test its ability to defend against a Soviet invasion across the North German Plain by employing tactical nuclear weapons. The results were disturbing. Umpires ruled that an estimated two million Germans would have been killed; a further three and a half million would have been injured, burned or irradiated; and the industrial heartland of Germany would have been rendered uninhabitable.

¹⁹ Midgely, pp. 38-40.

Long term casualties from radioactive fallout were not computed, but in only nine days of simulated nuclear combat, West Germany was judged to have suffered three times the civilian casualties of WWII.²⁰ The results of the exercise leaked to the press and created a furor in West Germany. Later that year, in November and December 1955, the Army and the US Air Force Tactical Air Command tested a similar scenario in Alabama and Louisiana in the largest ground exercise on American soil since the 1941 Louisiana Maneuvers.

The results of Operation Sagebrush were even more dismaying as virtually all participating ground units were judged to have been annihilated. Both the Army and Air Force initially discounted the results by saying the result would have been different if the actual enemy had been Soviet rather than American²¹, but the Army's new Chief of Staff, General Maxwell Taylor, was more realistic. He concluded, "We in the Army have a long way to go before we understand the problems of using these weapons....we would have probably destroyed ourselves and all our friends had we tossed atomic weapons about a real battlefield in the way we did in this maneuver."²² AFTA was quietly terminated in June 1956.

As these events were unfolding, the production of nuclear weapons began to accelerate dramatically. When Eisenhower took office the US had a total of about 1000 nuclear weapons, most of them strategic. The New Look strategy would require many more tactical nuclear

²⁰ Biddle, Stephen D. and Fewer, Peter D., "Roles and Missions of Battlefield Nuclear Weapons", in Biddle, Stephen D. and Fewer, Peter D. (eds), CSAI Occasional Paper No. 5: Battlefield Nuclear Weapons: Issues and Options. (Boston: Harvard University Center for Science and International Affairs), 1989, pg. 19.

²¹ Bracken, pg. 161. Sagebrush was conducted in the vicinity of Fort Polk, Louisiana, and involved four complete Army divisions, approximately 100 thousand troops. Army forces simulated nuclear strikes totaling approximately 19,000 kilotons, ranging from 2 kiloton atomic demolition munitions to 200 kiloton Corporal missile strikes. The Air Force simulated weapons with yields up to 500 kilotons. Umpires ruled the strikes would have resulted in 20,000 casualties and destroyed 2700 Army vehicles. The exercise after action report noted, "[It] should be apparent that concentration of atomic means against targets of these kinds [headquarters, logistic units, artillery units] would soon render infantry and armored units without adequate logistics support, fire support, and command coordination. Infantry and armored units in this situation would appear unable to avoid destruction in detail when faced by enemy forces". Most observers concluded the new AFTA design had failed. See Midgely, pp. 51-53.

²² Quoted in Chapter 10, Official History of the US Army. Available at <http://www.history.army.mil/books/lineage/m-f/chapter10.htm>.

weapons, and by the end of the decade there would be approximately 3000 of them deployed in Europe.²³ As the production momentum increased, new orders were placed with the Atomic Energy Commission at enormous cost, eventually consuming nearly ten percent of the total federal budget. By the middle of the decade a “nuclear production complex” had been created that absorbed 6.7 percent of the nation’s total electrical power.²⁴

Not surprisingly, the study of how to employ such a large number of tactical nuclear weapons in land combat became the Army’s principal focus in the 1950s. By 1955, nearly 50 percent of the instruction and training at Fort Leavenworth was devoted to tactical nuclear battlefield situations. Even that was thought to be inadequate. In 1956, the Continental Army Command which oversaw the activities of the Army’s educational institutions directed the Command and General Staff College “to depict atomic warfare as the typical and to treat non-nuclear warfare as modification to the typical” in future training and exercises. That year the CGSC curriculum included 614 hours of instruction on tactical nuclear weapons.²⁵

General Taylor was still faced with the need to develop a leaner force structure because of his steadily declining budget. The Army’s 1958 budget required it to reduce from 19 to 17 divisions to meet the one million soldier limitation imposed earlier by the Eisenhower administration. Since AFTA was a dead letter, he reached back to the 1953 Army War College study referred to above, the Pentagonal Atomic Non-Atomic Army (PENTANA) study, and approved it in June 1956 as the basis for research and development of new weapons, equipment, and organizational design. With the manpower deadline looming, and in an

²³ Schulte, Paul, “Tactical Nuclear Weapons in NATO and Beyond: A Historical and Thematic Examination”, in Nichols et al (eds.), pg. 21.

²⁴ Maier, Charles S., “The World Economy and the Cold War in the Middle of the 20th Century”, in Leffler, Melvin P. and Wested, Odd Arnie, eds., The Cambridge History of the Cold War, Vol. 1: Origins. (Cambridge UK: Cambridge University Press) 2010, pg. 64.

²⁵ During the years 1945-1949, Military Review, Fort Leavenworth’s professional journal, published a total of 8 articles on the ramifications of nuclear weapons on warfare. From 1950-1954 it published 32, and from 1955-1959 it published 132. Rose, John P., The Evolution of US Army Nuclear Doctrine, 1945-1980. (Boulder, CO: Westview Press), 1980, pg 57.

attempt to find a compromise between the War College force structure recommendations for the nuclear battlefield and the Army's existing force structure, Taylor elected to jettison the Army's existing infantry division design in favor of a new "pentomic" division—so named because it scrapped the traditional three-brigade divisional organization in favor of five smaller "battle groups" consisting of five infantry companies. The divisional artillery was similarly organized with each battalion consisting of five batteries. These bold new changes were intended to facilitate unit dispersion on the assumed nuclear battlefield. The Army's armored divisions were not reorganized, as their existing organization of three combat commands with heavily armored and mechanized infantry carriers was deemed adequate for a nuclear environment. By the end of the decade, the Army found itself completely reorganized to wage tactical nuclear warfare.

Many senior officers in the Army were appalled by Taylor's abrupt decision, which seemed to them capricious, unfounded, and untested. The Army's Chief of Engineers found "the concept completely unacceptable intellectually and scientifically. Rather than a hypothesis tentatively verified by controlled experiment and careful inductive reasoning, the PENTANA Army appears to be a goal to which certain highly artificial arguments have been added." The Commandant of the Command and General Staff College was even blunter: "No reasonable concept of operations has been advanced for PENTANA that I know of...[C]onclusions are being reached by a process that if paralleled in the industrial world would bankrupt any organization."²⁶

²⁶ Midgely pp. 66-67. There seems to be a tradition in the US Army of making sweeping force structure changes with little apparent thought or doctrinal foundation. In 1983, the Army's Chief of Staff, John Wickham, decided in the midst of the Reagan defense buildup to establish five new light infantry divisions. At the time the Army's principal mission was to find methods to offset Soviet armored units in Europe, a task for which light units were ill-suited. An officer in the Army's Force Development Directorate told the author at the time there was absolutely no doctrinal requirement or any other meaningful reason for the Chief's decision other than perhaps his desire, as a member of the Army's airborne "mafia", to find a mission for airborne and other light units to prevent them from becoming irrelevant. Because, he continued, the Army budget was large and expanding at this time, there was no penalty for doing so. After the decision, the Force Development Directorate ultimately *discovered* (my italics) sound doctrinal missions for these units.

These criticisms were ultimately found to be justified. Studies of the pentomic division design and doctrine by the Continental Army Command, the Army War College, and the Command and General Staff College subsequently confirmed that the new units could not effectively wage two-sided nuclear operations and had no significant advantages over the unmodified 1956 infantry division in a nuclear environment.²⁷ By 1959, Army planners realized that by attempting to design a single unit capable of operating effectively in a nuclear and non-nuclear environment they had created a force that could do neither. Soon, new studies were initiated to resolve this fundamental problem: the Modern Mobile Army (MOMAR), the Howze Board on the use of air mobility, and the Reorganization Objective Army Division (ROAD) Study that ultimately would be chosen as the basis to reconfigure the pentomic divisions. As Midgeley described it,

In each case the basic approach remained the same as in PENTANA—design the force and then claim that advanced technology would enhance the Army’s ability to fight using nuclear weapons if necessary. The Army’s actual ability to apply weapons on the battlefield remained unknown, and the Army’s doctrine for the nuclear battlefield became increasingly vague.²⁸

Although the Army continued to develop tactics, techniques, and procedures to employ tactical nuclear weapons, the utility of doing so was rarely, if ever, examined. According to Brigadier General (ret) Robert Richardson, who in the 1950s was a staff assistant to the NATO commander, General Lauris Norstad, Supreme Headquarters Allied Powers Europe, SHAPE planners in the 1950s were unable to come up with a single plausible scenario for the employment of tactical nuclear weapons and took comfort only in the thought that it must also be very difficult for planners in Moscow to do likewise.²⁹ This situation was deeply frustrating to

²⁷ *Ibid.*, pg. 73.

²⁸ *Ibid.*, pg. 96.

²⁹ May, Ernest R. and Kelleher, Catherine M., “History of the Development and Deployment of BNWs”, in Biddle and Fewer (eds.), pg 19.

General Lyman Lemnitzer, who succeeded Taylor as Army Chief of Staff and became Chairman of the JCS in September 1960. Not long after assuming this post, Richardson recalled attending a meeting in which Lemnitzer laid bare his frustration with the problem: “We are dead if they use nuclear weapons and we are postured to fight with conventional weapons; we are also dead if we are not allowed to use nuclear weapons and we are postured to use them, because they will then use conventional weapons.” After nearly ten years of doctrinal study and a major force redesign, the US military was no closer to solving the basic dilemma posed by tactical nuclear weapons than when it started. Survival in a nuclear environment required dispersion, while success in a conventional fight required mass and concentration. One force design could not do both simultaneously³⁰.

Despite this seemingly intractable doctrinal problem, the deployment of large numbers of newer and smaller tactical nuclear weapons surged ahead. According to one observer,

Often, it would appear, weapons went all the way through to production and deployment before anyone had the assignment of thinking about their operational use. Otherwise, it is hard to explain how US Army units in Europe came to have the Redstone Missile, which was supposed to function as corps artillery, but which had to be moved about by a nine-vehicle caravan, one component of which was a 25-ton, 90 foot crane. It is equally hard to explain how, after much lighter weapons became available, the Army employed some thousands of jeep-mounted, 2-4 kilometer range, one-quarter to one-half kiloton yield Davy Crockets. When President Eisenhower became aware of this, he said to his Defense aides “that when it comes to supplying small yield weapons to the Infantry and the Marines we are getting into the area of marginal utility...He

³⁰ Conference Proceedings, The History of NATO TNF Policy: The Role of Studies, Analysis, and Exercises, held September 12-14, 1990, Sandia National Laboratories, Livermore CA. Available at <http://www.osti.gov/bridge/servlets/purl/10132869-VYQc2C/native/10132869.pdf>.

suggested that we indoctrinate ourselves that there is such a thing as common sense.³¹

The fielding process took on a life and momentum of its own, seemingly unrelated to the requirements of units receiving the weapons and devoid of military input. There was little or no oversight of the development or deployment decision-making process by senior military officers, many of whom apparently lacked confidence in their ability to judge the issues. According to one Air Force expert testifying in a 1957 AEC hearing,

Most senior officers tend to consider atomic weapons to be beyond their understanding without exhaustive study with which they have neither the interest nor time. Atomic planning is therefore delegated to juniors who have completed various “effects” course...The seniors are unable to exert normal guidance. Instead, they are prone to endorse the computations without close questioning and without understanding procedures or implications—and in spite of personal misgivings.³²

The 1960s: Kennedy’s “Flexible Response”

When the Kennedy administration came into office in 1961 and Robert MacNamara took over at the Pentagon, this abrogation of military oversight seemed complete as senior officers were now forced to yield to scores of arrogant RAND “whiz kid” civilian analysts brought into government by the new Defense Secretary. One of them was 30-year old Alain Enthoven who famously replied to a question about nuclear warfare from a senior general, “General, I have fought as many nuclear wars as you have”.³³ MacNamara’s brash young analysts soon changed the direction of US strategic thinking and reoriented the military toward a strategy of “Flexible Response”. The new administration believed that Eisenhower’s New

³¹ May and Kelleher, pg 18.

³² Ibid., pg 20.

³³ Kaplan, Fred, The Wizards of Armageddon. (New York: Simon and Schuster), 1983, pg. 254.

Look policy of massive retaliation had left the US with insufficient flexibility to deal with challenges that might not meet the threshold for a nuclear response, and that a complete range of military responses to other Communist provocations was needed. On 25 May 1961, Kennedy directed the Army to reorganize its still relatively new pentomic divisions into units more suitable for non-nuclear warfare. The force design chosen was the ROAD division which closely approximated that of the pre-pentomic division.

Astonishingly, during this decade the number of deployed tactical nuclear weapons in Europe continued to soar, more than doubling from 3000 to more than 7000, as the result of production momentum and earlier weapon deployment decisions. The sheer magnitude of the numbers being deployed exerted a relentless pressure toward a strategy relying on decentralized nuclear operations. Although the nuclear battlefield was still poorly understood, it became the principal justification for equipment and weapon procurement, if not for force design. As a result, the gap between the technical capabilities of the US military and the tactical capabilities of its delivery units continued to grow.³⁴

This was amply demonstrated in October 1962 following another large NATO exercise on West German soil, FALLEX-62—the results of which were leaked to the German public by the magazine, *Der Spiegel*. The exercise not only demonstrated grave weaknesses in the *Bundeswehr*, but concluded that an estimated 10 to 15 million German civilians would have perished despite targeting efforts to minimize civilian casualties, many times more than in the 1955 *Sagebrush* exercise. The magazine concluded, “Civilian destruction at these levels is virtually impossible to explain in terms of rational foreign policy objectives.”³⁵ The news stunned the West German public and the ensuing political scandal eventually cost Defense Minister Franz Josef Strauss his job.

³⁴ Midgeley, pg. 112.

³⁵ Bracken, pg. 161.

The Army now made one final effort to develop a workable force structure for the nuclear battlefield. The Continental Army Command conducted an 18-month study of the problem from September 1963 to May 1965. Codenamed Oregon Trail, the study filled 21 volumes and was a stunning indictment of the ROAD division's inability to function on a nuclear battlefield. It warned,

[T]he ROAD force, if conventionally employed, would suffer more than 40 percent casualties in the first 30 days of a two-sided nuclear campaign...whenever the ROAD [division] concentrated sufficiently to conduct successful conventional operations, it offered lucrative nuclear targets which produced massive losses....when the ROAD-type force dispersed to avoid nuclear strikes, the units could be defeated by conventional tactics.³⁶

In a finding nearly identical to the 1953 Army War College study, it called for the employment of smaller combat units organized in depth to destroy enemy forces by indirect nuclear fires. A major difference, however, was that unlike the earlier study, Oregon Trail employed the quantitative modeling formulas so favored by McNamara's civilian experts, as well as nuclear effects data gleaned from nearly two decades of testing and years of unit performance information. Its conclusions seemed irrefutable.

No action was taken by the Army for three months. Finally, the Army's Assistant Chief of Staff for Force Development, Lieutenant General Theodore Conway, convened a board to study the Oregon Trail results and place them in a "wider context". The Conway Board, according to Midgely, "simply defined away the problems identified in the [Oregon Trail] study." While Conway acknowledged the inconsistency between nuclear and non-nuclear operations, he insisted only that the Army retain and improve its existing nuclear arsenal and recommended that the ROAD model be retained without change.³⁷ The Conway Board marked

³⁶ Ibid., pg. 117.

³⁷ Ibid., pg. 121.

the Army's final effort to resolve the nuclear-non-nuclear force structure dilemma. Henceforth, it would simply pretend the problem did not exist. This head-in-the-sand mentality was buttressed in January 1968 when NATO promulgated MC 14/3, its Overall Strategic Concept for the Defense of the North Atlantic Treaty Organization Area. Specifically addressing tactical nuclear weapons, the document stated,

Their primary purposes are to add to the deterrence of conventional attacks on any magnitude, and counter them if necessary, by confronting the enemy with the prospects of consequent escalation of the conflict; and to deter, and if necessary respond to, the use of tactical nuclear weapons by posing the threat of escalation to all-out nuclear war.³⁸

This was a radical new view. The sole purpose of tactical nuclear weapons would no longer be military, but political—to deter conflict by confronting an attacking force with the prospect of nuclear strikes that would ultimately escalate to a strategic nuclear exchange. The logical conclusion was that there was no longer a compelling need for ground forces to wage a protracted conflict on a nuclear battlefield. NATO would simply fight conventionally against the Warsaw Pact until one side or the other used tactical nuclear weapons. A strategic exchange would ensure and future tactical operations would be rendered superfluous. In essence,

Western commanders, faced with imminent defeat, would fire their tactical arms in desperation at advancing Soviet units, commit the whole matter to God, and retreat with as much order and bravery as they could muster while hoping either that the Soviet offensive would collapse or that the United States and its allies could force a cease-fire before things spiraled completely out of control.³⁹

³⁸ Document, Final Decision on MC 14/3, A Report by the Military Committee to the Defence Planning Committee on Overall Strategic Concept for the Defense of the North Atlantic Treaty Organization Area, 16 January 1968. pg. 16. Available at <http://www.nato.int/docu/stratdoc/eng/a680116a.pdf>.

³⁹ Nichols, Tom, "Preface", to Nichols et al (eds.), pg. ix.

Despite its implicit conclusion that tactical nuclear weapons had little utility in a future conflict with the Soviet Union other than to guarantee a strategic nuclear exchange, MC 14/3 did not result in any meaningful reduction in the NATO stockpile of such weapons for the next two decades. As new delivery systems were developed, they simply replaced aging systems that were retired.

The 1970s and 1980s: Return to the Familiar

The end of the Vietnam War in 1973 prompted a major reevaluation by all the services of their warfighting doctrines and a return to more traditional missions of conventional land, sea, and air warfare. Within a few years, in conjunction with the Air Force, the Army created the blueprint for what eventually became known as the first joint service warfighting doctrine, AirLand Battle. While strategic nuclear war against the Soviet Union was still considered to be a possibility, the services concentrated on developing new tactics to leverage new conventional military technologies like precision guided munitions and computer-driven command and control systems, worked “jointly” to create operational synergies between themselves, and eschewed tactical nuclear weapons as the principal means of offsetting the Soviet Union’s massive advantage in numbers and equipment. In the Army’s Field Manual (FM) 100-30 (Test) published in August 1971, tactical nuclear warfare was defined as a conflict “in which nuclear weapons are limited to the defeat of opposing forces in a theater of operations. Implicit in this definition is the condition that a strategic nuclear exchange on the belligerents’ homeland does not occur”.⁴⁰ Since this situation was unlikely ever to exist, there was no need to expend much effort to figure out how to employ the weapons.

This attitude is further illustrated by the 1975 Department of Defense Annual Report which contained nearly 20 pages of analysis about strategic nuclear warfare against the Soviet homeland and less than one page about tactical nuclear weapons, merely noting the unlikelihood they would ever be used:

⁴⁰ Midgeley, pg. 130

As a practical matter, the initiation of a [tactical] nuclear engagement would involve many uncertainties. Acceptable boundaries on such a conflict would be extremely difficult to establish. A nuclear engagement in the theater could well produce much higher military and civilian casualties and more widespread collateral damage than its non-nuclear counterpart....we must recognize in our planning that the decision to initiate the use of nuclear weapons—however small, clean, and precisely used they might be—would be the most agonizing that could face any national leader.⁴¹

When the Army published its capstone doctrinal manual in July 1976, FM 100-5, Operations, the nuclear battlefield was not even mentioned, and by 1977 there were virtually no guidelines on the battlefield employment of tactical nuclear weapons. Commanders knew how to request the use of nuclear weapons and fire them, but not how to fight with them in a tactical battle once permission was given.⁴²

In 1980, US Army Major John P. Rose, in a withering critique of Army doctrine pertaining to tactical nuclear warfare, accurately captured the state of thinking on the subject:

Currently, what the Army views as tactical nuclear doctrine is nothing more than conceptual guidance on how to plan a corps nuclear package....In essence, Army tactical nuclear warfighting doctrine does not exist....Under current doctrine US ground combat forces may never attain a decisive defeat of the enemy and consequently may never be able to terminate the conflict on acceptable

⁴¹ Schlesinger, James R. Schlesinger, Annual Report, Defense Department, FY 1975. pg. 19. Available at http://history.defense.gov/resources/1975_DoD_AR.pdf.

⁴² Midgeley, pg. 162. The FY 1985 Department of Defense Annual Report avoided the term “tactical nuclear weapons” at all, substituting “nonstrategic nuclear forces” whose role was simply described as “to help deter”. See Van Cleave, William R. and Cohen, S.T., Nuclear Weapons, Policies, and the Test Ban Issue, (Stanford CA: Hoover Institution, Stanford University), 1986. pg. 16.

terms....Tactical nuclear weapons are not seen by the Army as a war winning and warfighting instrument.⁴³

Rose's critique was actually an attempt to stimulate the Army to once again think about how best to employ tactical nuclear weapons to defeat Soviet ground forces in a European environment. In this he failed miserably because by the end of the 1980s, and despite the massive numbers of weapons deployed in Europe, there was little remaining doubt within the NATO alliance in general, and the United States in particular, about their lack of utility on the battlefield. As one observer put it, "Over the past thirty years, it has become generally accepted that NATO's battlefield nuclear weapons are neither militarily effective nor politically reassuring to the allies in whose countries they are based. There is much less agreement, however, about how the Alliance should respond to this problem." Another had a different explanation: "The continued presence of battlefield nuclear weapons in Western Europe is hard to explain in rational terms; it is more readily explicable by organizational and political inertia."⁴⁴

The fall of the Berlin Wall in 1989 and collapse of the Soviet Union and Warsaw Pact two years later essentially rendered the issue of tactical nuclear weapons moot, at least for the United States. In September 1991 President George H. W. Bush ordered the unilateral withdrawal of all ground-launched short range theater nuclear weapons and encouraged Soviet President Mikhail Gorbachev to do the same. President Gorbachev responded positively and proposed that the reduction also include similar naval weapons. By July 1992, the US announced it had completed the worldwide withdrawal of all surface and naval weapons. Only an estimated 400-600 air-delivered gravity bombs remained operational.⁴⁵ Today, this number has dwindled to an estimated 150-200 US tactical nuclear weapons assigned to NATO with the

⁴³ Rose, pg. 214.

⁴⁴ Sigal, Leon, "The Case for Eliminating Battlefield Nuclear Weapons", in Biddle and Fewer, pg. 34.

⁴⁵ Federation of American Scientists Intermediate nuclear Forces Chronology, Available at <http://www.fas.org/nuke/control/inf/inf-chron.htm>.

remainder stored in the continental United States, while Russia, the successor state to the Soviet Union, retains approximately 2,000 non-strategic warheads for potential use by ships, aircraft, and air defense forces, all said to be in central storage.⁴⁶ Several key NATO nations, Germany particularly, would like to remove the few remaining weapons, but their continued presence on European soil is less for any warfighting purpose than as a demonstration of the western commitment to the security of several former Warsaw pact members who have since joined the alliance and who continue to view Russia as a historic existential threat to their independence.⁴⁷ These divisions within NATO on the subject of tactical nuclear weapons resulted in maintaining the status quo, which was reaffirmed at the NATO Summit held in Chicago in May 2012.⁴⁸

US Lessons Learned About Tactical Nuclear Weapons

As this brief historical survey illustrates, despite fifteen years of effort, the US military failed to develop any coherent doctrine for the use of tactical nuclear weapons or to devise a workable force structure to employ them. Four decades of deploying, securing, and training to use tactical nuclear weapons revealed several other shortcomings, not the least of which was

⁴⁶ Kristenson, Hans M., and Norris, Robert S., "Russian Nuclear Forces, 2012", *Nuclear Notebook, Bulletin of the Atomic Scientists*, 68 (2) 87-92. Available at <http://bos.sagepub.com/content/68/2/87.full.pdf+html> and Kristenson and Norris, "US Tactical Nuclear Weapons in Europe, 2011", *Nuclear Notebook, Bulletin of the Atomic Scientists*, 68 (4). Available at <http://bos.sagepub.com/content/67/1/64.full>. The Stockholm International Peace Research Institute (SIPRI) has an estimate of 200 for US tactical nuclear weapons in Europe but states the Russian figure is approximately 4000. See <http://www.sipri.org/research/armaments/nbc/nuclear>.

⁴⁷ Schmidt, Oliver, *Proliferation Analysis*, 27 April 2011, "The Utility of US Tactical Nuclear Weapons in NATO". <http://carnegieendowment.org/2010/04/27/utility-of-US-tactical-nuclear-weapons-in-nato-european-perspective/7q7>. See also Woolf, Amy F., *Nonstrategic Nuclear Weapons*, Congressional Research Service. Available at <http://www.fas.org/sgp/crs/nuke/RL32572.pdf>.

⁴⁸ NATO Press Release (2012) 063 issued on 20 May 2012, "Deterrence and Defence Posture Review".. The press release indicated, however, that the North Atlantic Council would task appropriate committees to ensure the broadest possible participation in nuclear sharing arrangements, including in case NATO were to decide to reduce its reliance on non-strategic nuclear weapons based in Europe. Available at http://www.nato.int/cps/en/natolive/official_texts_87597.htm?mode=pressrelease.

escalation control. Taken together, these problems have created a general consensus, at least among knowledgeable US and NATO analysts, that tactical nuclear weapons simply do not belong on the modern battlefield for the following reasons:

They add little to deterrence. What deterred the Warsaw Pact from attacking NATO forces deployed on the North German Plain was not the possession of tactical nuclear weapons, but NATO's conventional capability plus the risk—virtually the guarantee—of escalation to the strategic level once tactical nuclear weapons were employed. As one analyst writing in the late 1980s noted,

Battlefield nuclear weapons add little, if anything, to deterrence. What deters nuclear war in Western Europe is the threat of nuclear retaliation. If the Soviet Union is not deterred from nuclear attack by the 10,000 plus warheads in the American nuclear arsenal capable of being delivered against the Soviet Union, it is hard to see how another 3,500 warheads intended for battlefield use will make any difference.⁴⁹

They invite preemption. During the Cold War, the bulk of NATO's tactical nuclear weapons deployed in West Germany were stored in approximately 20 sites, all probably known by the Soviet Union, and all no doubt carefully monitored by sophisticated technical systems or human means. In accordance with a 1946 four-power agreement, Soviet Military Liaison Mission teams had relatively free access to all but a small portion of West German territory and moved freely looking out for any indications of NATO offensive or defensive troop movement. According to a high-ranking Soviet military officer, "We had confidence in our knowledge of when NATO was preparing to launch nuclear weapons. We would detect mating of warheads to missiles and uploading of nuclear bombs and artillery. We listened to the hourly circuit verification signal and believed we would recognize a release order."⁵⁰ Any movement of

⁴⁹ Sigal, pg. 36.

⁵⁰ Barras, Gordon S., The Great Cold War: A Journey Through the Hall of Mirrors. (Stanford CA: Stanford Security Studies, Stanford University Press), 2009, pp 297-301.

weapons from the sites would have been spotted almost immediately, prompting the need for a decision by Soviet leaders about whether to attack the sites before the weapons could be completely dispersed. A decision to attack and destroy these sites would in turn have guaranteed immediate NATO retaliation on similar storage sites in Warsaw pact countries and started both sides up the nuclear escalation ladder.

They are not effective against mobile or armored forces. According to unclassified US Army weapons effects manuals, a one kiloton nuclear device would have to detonate within a 90 meter radius of a tank to inflict even moderate damage on that vehicle. In fact, prompt radiation from such a weapon is far more lethal to the crew of a tank than the blast effect, incapacitating crew members within a 360 meter radius.⁵¹ However, such a blast would not kill that many tanks or even incapacitate that many crew members in a deployed armor battalion maneuvering in battle. This was quickly recognized by Soviet military experts:

The advantage of the tank is that its armor protects the crew against light radiation and decreases the effect of penetrating radiation, while the tank's actual weight gives it stability which protects it against the shock wave....Thus, the conclusion can be drawn that the appearance of nuclear weapons not only failed to diminish, but on the contrary, only strengthened the role of the tank in battle.⁵²

An additional factor to be considered is the speed of advance of armor forces, especially in exploiting a gap in defenses, the precise situation that might necessitate the use of tactical nuclear weapons. As one analyst observed it,

They move too fast for a decision to be made to request permission for release authority, to obtain it, to unlock the weapons, to identify a target, and to gain

⁵¹ US Army Field Manual 101-31-3, Nuclear Weapon Employment Effects Data: Planning Staff Officers. Washington, D.C.: Department of the Army, 1977, Appendix E.

⁵² Quoted in Van Cleave and Cohen, Tactical Nuclear Weapons: An Examination of the Issues, g. 67.

the tactical commander's permission to fire. At best, the time to do this would take hours; at worst, it would take a day or two while political and military leaders thrashed out the implications.⁵³

They complicate command, control, and communications (C3). Nuclear command and control systems should be reliable, redundant, and separate from normal tactical command and control networks. They add a degree of complexity in C3 that does not exist on the conventional battlefield. Unless they are used first in preemption against an anticipated enemy attack, the need to employ tactical nuclear weapons will almost certainly occur in the midst of a tactical crisis. Thus, the need for nuclear C3 will come at precisely the time the communications system is most severely taxed and vulnerable to enemy disruption. Additional peacetime security measures like Permissive Action Link (PAL) technology to safeguard tactical nuclear weapons against unauthorized use add a further degree of complexity in wartime. According to Sigal,

PALs increase the likelihood that battlefield nuclear weapons, once dispersed, will be much harder to use since matching up weapons and transmitting the right messages to the right people would be difficult in a stressful communication environment of crisis or war. Yet unlocking the PALs before dispersal would only increase the chance of unauthorized use.⁵⁴

A final complication is the problem of war termination in a nuclear environment. Bracken notes,

The difficulties of limiting nuclear war once some weapons have actually exploded is compounded by the fact that ambiguous command will be overlaid onto a disconnected, broken up control system in which information and authority have become decentralized by reason of the attack. Under these

⁵³ Sigal, pg. 46.

⁵⁴ Ibid., pg. 45.

circumstances, isolated forces could continue to salvo, effectively destroying any tacit cease fire that had developed.⁵⁵

Nuclear release authority for tactical targets is difficult to obtain. As discussed above, obtaining a political decision to use tactical nuclear weapons in a battlefield crisis is likely to be time consuming. The 1976 version of US Army FM 100-5 suggested the likelihood of a minimum 24-hour delay between a request from a field commander and the political decision to authorize their use. Even this degree of delay is probably generous. The weapons might not be readily available if the tactical crisis occurs in the initial stages of a conventional defense because the political decision to move them out of their storage sites would be difficult to obtain because of the increased risk of preemption.

They are difficult to secure when deployed and require scarce manpower. As long as they are in their peacetime storage locations, tactical nuclear weapons are reasonably safe and secure. However, upon deployment, their security becomes an additional responsibility for the delivery unit. Unless augmented by additional security personnel, there are normally not enough personnel in a tactical delivery unit to adequately guard them on a 24/7 basis. This creates a heightened risk that deployed weapons might be seized or destroyed by an enemy's special operations forces. The post-deployment security problem was well understood, but never entirely solved in Europe by US forces despite a massive and expensive effort to do so. By one estimate, as much as 10 percent of US manpower in Europe in the 1980s was required for the protection and special handling of tactical nuclear weapons. As the number of nuclear delivery units increased, the number of personnel required to secure them increased, and the numbers of personnel available for purely conventional military operations grew smaller. General Bernard Rogers, the SACEUR, stated in May 1985, "What is happening is as I get spaces for ground-launched cruise missiles, I am bringing in nuclear weapons and sending conventional forces home."⁵⁶

⁵⁵ Bracken, pg. 230.

⁵⁶ Sigal., pg. 42.

Nuclear launch units must be withdrawn from battle to ensure their survivability.

Another dilemma field commanders will face is when—or whether—to withdraw or withhold dual-capable nuclear delivery forces from conventional battle in order to ready them for nuclear use. This will generally have to be decided when the conventional fight is at its most intense and the outcome still in doubt—when their participation in the conventional battle is most urgently required. To compound the problem, an enemy might detect the withdrawal of these forces from the battlefield and interpret the event as a precursor to their use against his forces—and thus decide to launch his own preemptive nuclear strike.

They are not decisive. But most importantly, there is little prospect tactical nuclear weapons would actually be decisive if used in battle. NATO “studies have concluded time and time again that a two-sided exchange of battlefield nuclear weapons would quickly destroy both sides’ forward combat forces, after which the Warsaw Pact could win the ground battle by bringing forward reserves that NATO could not match.”⁵⁷ Faced with defeat by an enemy’s conventional forces, the other side would either expend tactical nuclear weapons or escalate directly to the strategic level. The ultimate effect of either decision would be the same—a strategic nuclear exchange.

Current Attitudes about Tactical Nuclear Weapons: Russia, India, and the United States

Not all nuclear weapons states, certainly Russia and Pakistan, and possibly India, have reached a similar conclusion. This accounts for the large stockpile of tactical nuclear weapons retained by the former, albeit mostly in storage, and the large number of short range battlefield systems under development by the latter two. Russia’s retention of a large stockpile of tactical nuclear weapons is the easiest to explain. After the collapse of the Soviet Union, Russia had to adapt to a greatly changed security environment and a vastly diminished military capacity. While rejecting the Soviet Union’s no-first-use pledge in 1993, it seemed to view nuclear weapons as defensive, a deterrent to conventional or nuclear attack and as a means to retaliate

⁵⁷ Uttgoff, Victor and Christenson, William, “Battlefield Nuclear Forces: An Undervalued Option for Improved Deterrence In Europe”, in Biddle and Fewer, pg. 98.

if an attack were to occur. This continuing reliance on tactical nuclear weapons reflected the fact that Russia could no longer afford to maintain large and effective conventional forces. Subsequent conflicts in Chechnya and Georgia demonstrated glaring weaknesses in Russian conventional forces as new threats emerged in former Soviet states along Russia's southern periphery. Many analysts believed that by threatening, even implicitly, that it might resort to nuclear weapons, Russia hoped to deter similar regional conflicts in former Soviet Union territory. Russia's perception of increased vulnerability was further magnified by NATO enlargement and concern that former Warsaw Pact nations who joined NATO would bring NATO nuclear weapons closer to Russia's borders.⁵⁸ While Russia can be expected to maintain a robust strategic nuclear capability, its reliance on tactical nuclear weapons may diminish as political stability and an improved economy allow it to improve its conventional forces. There are indications it has already eliminated all ground forces tactical nuclear weapons while retaining only naval, air-delivered, and air defense weapons.⁵⁹

India's position on tactical nuclear weapons is murkier. Despite a large conventional military superiority over Pakistan, it has regional (if not global) aspirations driving the growth and capability of its military forces far beyond what should be required to deal with Pakistan, a situation undoubtedly contributing to Pakistan's feeling of insecurity. While not formally acknowledging the utility of tactical nuclear weapons, it is currently developing eleven short range platforms that could easily be modified to carry nuclear warheads.⁶⁰ In 1999 India released an unclassified version of a nuclear doctrine that seemed to reject the notion of limited nuclear warfighting:

⁵⁸ Woolf, Amy F., "Nonstrategic Nuclear Weapons", Congressional Research Service, 29 May 2012, pg. 25. Available at <http://www.fas.org/sgp/crs/nuke/RL32572.pdf>.

⁵⁹ See Ibid., pg. 21 and Kristenson and Norris, "Russian Nuclear Forces, 2012", pp. 89-90.

⁶⁰ These eleven systems include three variants of the Prithvi SRBM with ranges between 150 and 350 kms; the Agni-1 SRBM with a 700 km range; the Prahaar SRBM with a 150 km range; the Dhanush naval SRBM with a 350 km range; two anti-shiping missiles, the 65 km Ametist and 78 km Popeye; and three cruise missiles, the 1000 km Nirbay, 290 km Brahmos, and 120 km Moskit.

India shall pursue a doctrine of credible minimum nuclear deterrence....any nuclear attack on India and its forces shall result in punitive retaliation with nuclear weapons to inflict damage unacceptable to the aggressor. The fundamental purpose of Indian nuclear weapons is to deter the use and threat of use of nuclear weapons by any State or entity against India and its forces. India will not be the first to initiate a nuclear strike, but will respond with punitive retaliation should deterrence fail.

Publicly, senior Indian military leaders continue to assert this position. Rejecting what he characterized as continuing veiled threats by Pakistan to use tactical nuclear weapons as a deterrent to India, Indian Chief of Army Staff General V.K. Singh stated in January 2012, "Let's be quite clear on it....Nuclear weapons are not for war-fighting. They have got a strategic significance and that is where it should end."⁶¹ Even the most hawkish Indian defense analysts agree with this approach. In a paper laying out the inherent difficulties in developing and deploying tactical nuclear weapons, Brig. (ret.) Gurmeet Kanwal strongly advocates that India reject the temptation to match the Pakistani tactical nuclear weapons arsenal or attempt to fight a limited nuclear war in the event Pakistan uses a nuclear weapon on Indian forces. Instead,

The only sensible option may perhaps be to call Pakistan's nuclear bluff and plan to launch Strike Corps operations to achieve strategic gains in as early a time frame as is militarily possible. This approach will need to be combined with a declaratory policy that a nuclear strike against Indian soldiers, even if they are deep inside Pakistani territory, will constitute the use of nuclear weapons against

⁶¹ Pandit, Rajat, "Nuclear Weapons Only for Strategic Deterrence—Army Chief", *Times of India*, 16 Jan 2012. Available at http://articles.timesofindia.indiatimes.com/2012-01-16/india/30631202_1_nuclear-arsenal-nuclear-retaliation-nuclear-weapons.

India and will invite massive counter value and counter force punitive retaliation against Pakistan.⁶²

Other Indian analysts like Manoj Joshi and Brahma Chellaney differ sharply, arguing respectively for tactical nuclear weapons on the grounds that without them, should deterrence fail, India's culture of restraint would inhibit the countervalue response presumed in the Indian Nuclear Doctrine, and that India should have other nuclear options along the ladder of escalation that allow the opportunity for a deal to be struck with Pakistan before any future conflict escalates to a general nuclear exchange.⁶³ Doubtless this debate will continue, but it now appears that before India embraces a culture of tactical nuclear weapons a major change in thinking in both the military and civilian senior leadership in New Delhi must occur.

Admittedly, the United States, in addition to the 150-200 weapons it has assigned to NATO, maintains another 850-900 nonstrategic nuclear weapons in storage in the continental United States.⁶⁴ Nevertheless, both the Bush and Obama administrations have been committed to substituting enhanced conventional weapons for the ever-diminishing number of tactical nuclear weapons remaining in the US inventory. This small stockpile of nonstrategic weapons continues to exist probably for three narrow purposes, none of which are for warfighting: to reassure anxious Eastern European NATO allies of the US commitment to their defense, as a potential bargaining chip in future negotiations with Russia to reduce overall numbers on nonstrategic weapons, and to retain the capability for a new generation of hardened nuclear penetrators to attack deep underground facilities. The current number of weapons is expected to decrease even further as the Obama administration has stated it plans

⁶² Kanwal, Gurmeet, "Does India Need Tactical Nuclear Weapons?", Institute for Defence Studies and Analyses, New Delhi, no date given. Available at <http://www.idsa-india.org/an-may-03.html>.

⁶³ See Joshi, Manoj, "Ballistic Missile Nasr—A Bigger threat from Pakistan," *India Today*, 2 Jun 2011, available at <http://indiatoday.intoday.in/story/pakistans-short-range-ballistic-missile-nasr-is-a-matter-of-concern-for-india/0/140087.html> and Chellaney, Brahma, "Nuclear Deterrent Posture", in Brahma Chellaney (ed.), *Securing India's Future in the New Millennium*, (New Delhi: Orient Longman Limited, 1999), pp. 209-214.

⁶⁴ Woolf, Report Summary.

to retire all remaining sea-launched cruise missiles and retain only a small number of B-61 air-dropped gravity bombs.

This leaves Pakistan as the outlier state in terms of its advocacy for tactical nuclear weapons employment, presumably because its senior military leaders believe that such weapons are a relatively inexpensive means to offset India's conventional superiority. Therefore, the remainder of this chapter will concentrate primarily on this argument with the stipulation that should India begin to move in the same direction, the same logic will apply to it as well.

Pakistan's Argument in Favor of Tactical Nuclear Weapons

There is as yet no authoritative statement from the Pakistan military about the justification for developing so many new short-range nuclear-capable systems other than occasional references to systems designed for each level of warfare along the spectrum of conflict.⁶⁵ Following the March 2012 test of the *Abdali* short range ballistic missile, the ISPR press release noted that it "provides an operational level capability to Pakistan's Strategic Forces, additional to the strategic and tactical level capability, which Pakistan already possesses".⁶⁶ And during recent calls on him by visiting US government and academic visitors,

⁶⁵ These references generally mirror US Department of Defense terminology which defines the three levels in this way: the **Strategic Level of War** is the level of war at which a nation determines national security objectives and guidance, and develops and uses national resources to accomplish these objectives. The **Operational Level of Warfare** is the level of war at which campaigns and major operations are planned, conducted, and sustained to accomplish strategic objectives within theaters or areas of operations. The **Tactical Level of Warfare** is the level of war at which battles and engagements are planned and executed to accomplish military objectives assigned to tactical unit. Available at <http://usmilitary.about.com/od/glossarytermso/g/o4531.htm>.

⁶⁶ ISPR Press Release Number PR34/2012, 5 March 2012. Available at http://www.ispr.gov.pk/front/main.asp?o=t-press_release&date=2012/3/5.

Lieutenant General (ret) Kidwai occasionally refers to the Indian Army Cold Start doctrine and jokes that the intent of Pakistan's short-range systems is to, "Pour cold water on Cold Start".⁶⁷

Nevertheless, Pakistan's new tactical nuclear weapons narrative can be gleaned from the writings and presentations made by the published works and presentations made at recent "Track 2" seminars and conferences by Pakistani national security analysts, academicians with close ties to the Pakistani military, and retired senior military officers. For the sake of brevity the narrative can be summarized generally as follows:

— India's massive military modernization program is eroding the reasonable conventional military balance that Pakistan has traditionally relied on to deter war. As a consequence, this "weakening of the conventional fence encourages adversaries to initiate limited blackmailing or adventurous military operations which are prone to risk escalation....the threat of tactical nuclear weapon use will deter limited war between India and Pakistan".⁶⁸

— India's provocative military doctrine, Cold Start, seeks to create space for a conventional war with Pakistan while remaining below the threshold of Pakistan's traditional nuclear "redlines". According to Adil Sultan, this new warfighting doctrine poses a direct challenge to Pakistan's present strategic nuclear deterrent. "In response to limited military incursions by the Indian forces," he explains, "the threat to destroy New Delhi or Mumbai seemed incredible and disproportionate...In addition to [existing] strategic-level deterrence capability, Pakistan aims to build credible deterrence capability at the operational and tactical levels, which could possibly be described as a 'Strategy of Assured Deterrence'".⁶⁹

⁶⁷ The author has heard this quotation attributed to Kidwai from three different sources, each of whom wishes to remain anonymous.

⁶⁸ Jaspal, Zafar Nawaz, "Tactical Nuclear Weapon: Deterrence Stability between India and Pakistan", in Khan, Feroz H. and Masellis, Nick M., US-Pakistan Strategic Partnership, A Track II Dialogue, Sixth Iteration, Phuket, Thailand, (Monterey CA: Center for Contemporary Conflict, US Naval Postgraduate School), January 2012. pg. 10.

⁶⁹ Sultan, Adil, "Pakistan's emerging nuclear posture: impact of drivers and technology on nuclear doctrine", Strategic Studies, ISSI, Vol XXXI & XXXII, Winter 2011 & Spring 2012, Nos 4&1. Available at http://www.issi.org.pk/publication-files/1340000409_86108059.pdf.

— Tactical nuclear weapons can be used in the event of an Indian “proactive defense”/Cold Start-style contingency without triggering a wider Indian nuclear response. Major General (ret) Qasim Qureshi notes the significant risks inherent in any use of tactical nuclear weapons “and the chances that something goes wrong resulting in a nuclear exchange cannot be ruled out. It is precisely this danger and uncertainty that from Pakistan’s point of view will ensure stability of deterrence in the conventional domain”.⁷⁰ Mansoor Ahmed similarly acknowledges the danger of nuclear escalation, noting that the Indian military has already indicated that any use of tactical nuclear weapons against its conventional forces will trigger a massive nuclear response. However, he believes “Pakistan’s eventual development of assured second strike capabilities would largely exclude the possibility of such an Indian retaliation/disproportional response”.⁷¹

Maria Sultan, an Islamabad-based Pakistani scholar who is currently Director General of the South Asian Strategic Stability Institute, has even proposed a new doctrine for the employment of tactical nuclear weapons. In an article published in the Pakistan Army’s *Hilal* magazine and serialized in a major English language newspaper in Pakistan⁷², Sultan described her theory of Integrated Strategic Equivalence, which calls for maintaining centralized control of strategic nuclear weapons (defined as having ranges from 300-3500 km and up to 1000 kg payload) while delegating authority to deploy and employ tactical range weapons (having ranges of 100-300 kms). She also advocates “selective target engagement on the Indian side” at the onset of a “Cold Start” operation of three categories of targets: first, the extended lines of communication into India; second, offensive corps command and control centers (specifically to be attacked by tactical nuclear weapons); and third, attacking unspecified counter-value targets in India, presumably cities. This would allow Pakistani decision-makers to have

⁷⁰ Qureshi, Qasim, “Deterrence Stability in South Asia”, in Khan and Masellis, pg. 5.

⁷¹ Ahmed, Mansoor, “Security Doctrines, Technologies and Escalation Ladders: A Pakistani Perspective” Ibid., pg 10.,

⁷² Sultan, Maria, “Cold Start Doctrine and Pakistan’s counter- measures: theory of Strategic Equivalence-III” The News, 30 September 2011. Available at <http://www.thenews.com.pk/TodaysPrintDetail.aspx?ID=70218&Cat=2>.

“initiative dominance of the battlefield while maintaining control and decision at the strategic level”.

The Relevance of the American Experience to Pakistan

As previously stated, a part of Pakistan’s general nuclear narrative is that the US Cold War experience is not a good model for Pakistan. A former military official notes that the disparity in conventional military forces is “generally where the comparison ends”, noting that the US and Soviet Union deployed tactical nuclear weapons only on the territory of client states; that the numbers, yields, and variety of weapons deployed was different; and that only the Conventional Forces in Europe (CFE)—not the Intermediate Nuclear Forces (INF)—arms control process could be considered as relevant.⁷³ He is partly correct—there are many obvious differences between the Cold War standoff between the US and Soviet Union and the situation faced by Pakistan and India. The US and the Soviet Union were global superpowers deploying tens of thousands of nuclear weapons against each other around the world. While India may one day become a superpower, Pakistan cannot aspire to reach that level of development, and neither can likely afford a superpower-sized nuclear arsenal. Currently, both India and Pakistan probably have no more than about a hundred nuclear weapons apiece and at the current estimated rate of production, neither is likely to double that total for nearly a decade.⁷⁴

⁷³ Statement made at a conference in 2012. The person cannot be further identified under the rules governing the conference discussions.

⁷⁴ Any estimate of Indian or Pakistani fissile material production is speculative at best. Kristenson and Norris estimate India has produced 520 kg of plutonium, sufficient for 100-130 nuclear warheads, but further estimate India has only 80-100 warheads. They note that the planned construction of a second plutonium reactor at Visakhapatnam and a fast breeder reactor at Kalpakkam will significantly enhance its capacity but provide no figures for future warhead production. For Pakistan, Kristenson and Norris cite a 2010 estimate by the International Panel on Fissile Materials that Pakistan has produced approximately 2600 kg of highly enriched uranium and 100 kg of plutonium, enough for 160-240 warheads depending on size and design. They further estimate Pakistan to have 90-110 useable warheads and a current annual production capacity of 120-180 kg of HEU and 12-24 kg of plutonium, an amount sufficient to produce 10-21 warheads depending on size and design. See Kristenson, Hans M., and Norris, Robert S., “Indian Nuclear Forces, 2012”, Nuclear Notebook, Bulletin of the

Although the US, like Pakistan today, faced a huge conventional military imbalance against its principal adversary, it had a stronger economy, more advanced weapons systems, better command and control, and better synergy between its armed services to narrow the gap. Pakistan's economy is only one-seventh of India's and steadily declining relative to it, and has only limited numbers of high-technology weapons and increasingly limited access to western arms. India, on the other hand, has unfettered access to western technology and a sufficiently robust economy to buy as much as its political leaders deem necessary.

Aside from these superficial differences, there are four more significant differences between the Cold War and South Asia models. The first involves the way the two sides have treated each other. Despite their often tense and chilly relationship, the US and the Soviet Union never severed relations, practiced regular and robust summit diplomacy, settled many post-WWII territorial issues in Europe, and struck a series of far reaching strategic arms control and reduction agreements spanning several decades. In comparison, India and Pakistan are diplomatically immobilized by the Kashmir issue, have been unable to finalize an agreement on any of several other outstanding territorial disputes, and have not negotiated a meaningful military or nuclear-related confidence building measure in more than a decade.

Second, the US and the Soviet Union established a clearly understood if informal set of rules governing their behavior toward other. While they occasionally fought proxy wars, these were always far from each others' homeland. Both sides exercised great caution in Europe and other areas where their military forces directly confronted each other. During the 1962 Cuban Missile Crisis, for example, both sides blinked rather than force the other to the nuclear brink: the Soviet Union elected not to challenge a US naval quarantine of Cuba and President Kennedy ignored a belligerently worded message from Premier Khrushchev and answered a more benignly worded message sent earlier. Kennedy later quietly removed Jupiter missiles from

Atomic Scientists, 68 (4) 96-101. Available at <http://bos.sagepub.com/content/68/4/96.full.pdf+html> and Kristenson, Hans M., and Norris, Robert S., "Pakistan Nuclear Forces, 2011", *Nuclear Notebook, Bulletin of the Atomic Scientists*, 67 (4) 91-99. Available at <http://bos.sagepub.com/content/67/4/91.full.pdf>.

Turkey, an action the Soviets no doubt had considered as provocative to them as their missiles in Cuba were to the US. In comparison, Pakistan and India have gone to war with each other three times and taken actions bringing them to the brink of war on several other occasions. During the last two major crises, Kargil and the Twin Peaks Crisis of 2001-2002, external diplomatic intervention by the United States and others arguably helped defuse both before either crises reached a culminating point. Such interventions cannot be guaranteed in the future. What makes the current situation potentially ever more explosive is that for the past twenty years, Pakistan has provided training and operational support to extremist groups conducting terrorist operations not only in Kashmir, but in India's major cities as well, all the time relying on its nuclear capability to forestall Indian military retaliation. While it can be argued that such support is provided only by low-level operatives or retired military personnel and is not approved at higher levels of the military or intelligence chains of command, India's perception of Pakistan Army culpability will inevitably influence its response if a future high profile terrorist event occurs.

A third major difference is the security environment of the territory in which nuclear weapons are stored. All US and Soviet nuclear weapons were stored in territory fully under their own control or that of their allies. In peacetime, there was very little concern about the safety and security of nuclear weapon storage sites whether they were in West Germany, South Korea, or on the territory of other NATO allies. In Pakistan, the security environment is far less benign with large swaths of the country having become virtually ungoverned territory. As Chaim Braun explains:

Due to its unique characteristics, history, and the nature of its internal as well as external politics, Pakistan has allowed the emergence of an entire infrastructure of terrorist organizations within its borders. Up to 50 to 60 active or partially active terrorist groups are estimated to operate in the country in pursuit of their own nihilistic, sectarian, or pan-Islamic goals....In addition to this terror infrastructure, one should consider simmering regional and sectarian strife between the Punjabis and the Sindhis, the Punjabis and the Baluchis, and

between the majority Sunni and minority Shia communities, On top of all these, we should consider the existence of large-scale foreign terrorist base areas within Pakistan, only partially controlled by the government, if at all. In this category, we include the Taliban and the International Islamic Group (al-Qaeda and their associate Chechen, Uzbekistani, Arab, and other groups).⁷⁵

The final difference is that of nuclear “redlines”. Because of the relatively short distance between the inter-German border and the Rhine River, the first major natural obstacle on which to base a second line of defense, NATO forces in West Germany were required to defend against a Warsaw Pact invasion as far forward as possible. The same military imperative exists for Pakistan. However, NATO’s nuclear “redlines” were far more conservative than Pakistan’s seem to be becoming. The triggering event for a request to use tactical nuclear weapons by NATO ground commander’s would likely have been the imminent tactical defeat of a NATO corps, a situation that would have unhinged its conventional defense scheme. By the time release was likely to have been granted, NATO land forces would almost certainly have been compelled to withdraw to the Rhine River, a distance of at least 120 kms.⁷⁶ Pakistan’s nuclear redlines, while deliberately ambiguous as a matter of policy, were until recently considered by western analysts to be generally those enunciated by Lieutenant General (ret) Kidwai to a visiting team of Italian scholars in 2002: nuclear weapons would be used only if Pakistan’s national existence were threatened, and that triggering events would likely be the loss of significant territory, the destruction of large parts of the Pakistan Army and/or Pakistan Air Force, economic strangulation caused by a blockade or cutoff of water resources, and large

⁷⁵Braun, Chaim, “Security Issues Related to Pakistan’s Future Nuclear Power Program”, in Alexander, Brian and Millar, Alistair (eds), Tactical Nuclear Weapons: Emerging Threats in an Evolving Security Environment, (Washington DC: Brassey’s), 2003.. pp. 334-335.

⁷⁶ The distance between Warsaw Pact forces deployed on the inner-German border near the Fulda Gap in south central West Germany and the Rhine River near Mainz or Wiesbaden. The author participated in several major NATO exercises in the 1970s and this event was generally assumed by senior commanders to be the trigger for requesting the selective release of nuclear weapons. With typical black humor, we often joked that “success” could be defined as delaying the Warsaw Pact advance to the Rhine for 96 hours, while “failure” would be delaying for 72 hours or less.

scale internal subversion that threatened domestic stability.⁷⁷ However, Pakistan's new tactical nuclear narrative implies that these traditional redlines have changed and that a decision to employ tactical nuclear weapons could be made well before Pakistan finds itself in an *in extremis* situation.

But amid these differences in the two models there is at least one area of similarity, the problem of defining what is or is not a tactical nuclear weapon. One of the first lessons learned by the US during decades of strategic arms negotiations with the Soviet Union is that it is extremely difficult to define a "tactical" nuclear weapon. The definition could not be based solely on yield because a 300 KT gravity weapon carried by a tactical fighter-bomber aircraft—clearly a tactical weapon—far exceeded the 150 KT yield of a warhead atop a Trident ballistic missile—clearly a strategic weapon. Some analysts argued the designation should be based on use, with nuclear weapons employed on counterforce targets being considered "tactical" and those aimed at countervalue targets being considered "strategic", but that definition would have made many relatively short range systems dual use. In the context of the SALT negotiations of the 1970s and the START negotiations of the 1980s, non-strategic nuclear weapons eventually came to be considered by both sides as those carried by tactical air forces, naval vessels and aircraft, sea and land-based cruise missiles and air-launched cruise missiles with ranges less than 600 kms, artillery and atomic demolition munitions, and ballistic missiles with a range less than 5500 kms. However, from the Russian perspective, the targeting dimension of these nonstrategic systems also had to be considered. For example, at the beginning of the SALT I negotiation the Soviet side indicated that NATO's intermediate and short range nuclear missiles must be considered strategic if they were targeted at the Soviet Union. The US initially disagreed, but eventually agreed to accept this formulation.⁷⁸ The problem in South Asia is identical: the proximity of the two sides' nuclear forces makes any attempt to distinguish between "strategic" and "tactical" nuclear systems a fruitless endeavor.

⁷⁷ Hoyt, Timothy D., "The Buddha Frowns: TNWs in South Asia", in Alexander and Millar, pg. 103.

⁷⁸ Safranchuk, Ivan, "Tactical Nuclear Weapons in the Modern World: A Russian Perspective", in *Ibid.*, pg. 50.

During the Cold War the distance between the closest NATO nuclear missiles and Moscow was approximately 2000 kms. The distance between the India-Pakistan international border and Islamabad and New Delhi is 278 kms and 423 kms respectively. Logically, if NATO intermediate range missiles were strategic because they could range Moscow, most Indian and Pakistani short-range systems are also strategic. Both the US and Soviet Union had a minimum of thirty minutes between detection of a strategic missile exchange to decide on a response; Pakistan and India would have a few minutes at best. Because of this proximity issue, there are essentially no tactical nuclear weapons in South Asia—all should be considered strategic. This logic seemed to be accepted both by Pakistan military and civilian analysts until 2010, after which time the nuclear narrative began to change.

So yes, the Cold War model is not exactly analogous to the current situation in South Asia. The latter is infinitely more complex—and potentially more dangerous. But this does not mean that the US experience in managing and securing tactical nuclear weapons has no relevance for Pakistan, or for India if it chooses the same path. Many, if not all, the lessons learned by the US and its NATO allies about the complexities and inherent dangers of managing a tactical nuclear weapon stockpile are directly applicable. If Pakistan continues to build and deploy more of these weapons as its fissile production capability expands it will have to address the same issues the US dealt with in four decades of managing and securing its nuclear arsenal during the Cold War. Several of the lessons identified above apply directly to Pakistan:

They will add little to deterrence. India will not be deterred from initiating a “proactive defense”/Cold Start operation by the deployment of short-range battlefield systems like the *Nasr* or *Abdali*, but out of concern that in a future war escalation cannot be controlled, and that eventually Pakistan’s longer range missiles and higher yield nuclear warheads can be employed against its cities. The continual references in ISPR press releases and published articles to nuclear systems designed for the tactical level of warfare seem to imply an unsubstantiated Pakistani conviction that no interconnected spectrum of conflict exists and that actions at the tactical or operational levels of warfare do not have strategic implications. The NATO airstrike that killed 24 Pakistani soldiers at a border post along the Durand Line in November 2011 and

the consequent closure of NATO lines of communication into Afghanistan for seven months would seem to be a lesson worth pondering in this regard.

They will complicate safety and security. More tactical nuclear weapons and a larger supporting nuclear infrastructure logically means more fissile material being produced and moved around the country to various manufacturing and storage locations. It also means more personnel will need to be cleared, periodically screened, and monitored for reliability that will have access to information desired by groups wanting to seize the weapons for their own agendas. Shaun Gregory estimates:

As many as 70,000 people in Pakistan reportedly have access to, or knowledge of, some element of the Pakistani nuclear weapons production, storage, maintenance, and deployment cycle, from those involved in the manufacture of fissile material, through those engaging in nuclear weapons design, assembly and maintenance, to those who transport and safeguard the weapons in storage and would deploy the weapons in crises. That number will also rise steadily as the size of the nuclear arsenal grows.⁷⁹

This situation would create an added risk that one of a plethora of extremist groups currently operating with near-impunity in Pakistan might see their deployment as an irresistible once-in-a-lifetime opportunity to obtain a nuclear weapon. Since small tactical nuclear weapon warheads are usually fully assembled, with the fissile material already inserted into the warhead, unless they are manufactured to be “one-point-safe”⁸⁰, meaning that a high explosive applied to the warhead cannot produce a nuclear yield, any militant group that obtains such a weapon would have the ability to cause catastrophic damage to Pakistan or other states. Even

⁷⁹ Gregory, pg. 5.

⁸⁰ The US Department of Energy defines a One-Point Safe Nuclear Explosive as a device which in the event of a detonation initiated at any one point in the high explosive system presents no greater probability than one in a million of achieving a nuclear detonation. DOE Order 5610.11, 10 October 1990. Available at http://www.fas.org/nuke/guide/usa/doctrine/doe/o5610_11/o5610_11p.htm.

if a fully assembled weapon isn't seized, the loss of fissile material that could be made into an improvised radiological weapon would be nearly as catastrophic.

They will invite preemption. Technical surveillance systems in South Asia are as yet not as advanced as those of the Soviet Union, but in a decade or less India's space surveillance capability will be more mature and will almost certainly be employed to monitor Pakistan's nuclear storage sites. As more short range nuclear delivery systems are fielded, they will constitute an increasingly tempting target in the event of military mobilization. The security forces needed to safeguard the weapons in a tactical environment will also create a larger unit "signature" for India to detect, and this will trigger a very short window of opportunity to deliberate the consequences of a preemptive attack. Therefore, what little perceived value they add to deterrence will be more than offset by their contribution to crisis instability and the increased risk of inadvertent escalation.

They will complicate command, control, and communications. The concerns about C3 identified by the US experience apply directly to Pakistan and need not be repeated here. However, there may be two additional complications which should be addressed that are related to the issue of Permissive Action Links (PAL). There is no information about whether Pakistan presently has or intends to develop PAL technology. But the use of PAL technology is a two-edged sword: if used, they add a further complication to C3 at the most critical point in the battle, and if they are not used their absence adds a further security issue in the event they are captured by extremist groups.

They will be expensive. According to Pakistani scholar, Pervez Hoodbhoy, the cost of developing Pakistan's nuclear was approximately \$4 billion, or \$200 million per year over twenty years, not insignificant for an economy the size of Pakistan's, but a bargain compared with raising and maintaining large conventional forces⁸¹. But it is one thing to build a few large

⁸¹ Hoodbhoy, Pervez, "Pakistan's Nuclear Future", in Ahmed, Samina and Cortwright, David, (eds.), Pakistan and the Bomb: Public Opinion and Nuclear Options, (Notre Dame, IN: University of Notre Dame Press), 1998. pg. 77.

nuclear weapons for delivery by missile forces and the country's existing aircraft fleet, and entirely another to develop a nuclear triad: Army, Naval, and Air Strategic Force Commands controlling a missile force of intermediate, short-range and tactical missiles; air, ground, and sea-launched cruise missiles; potentially other short range systems like nuclear artillery, atomic demolition munitions, and nuclear torpedoes; the fissile material production and weapon manufacturing capacity required to build so many weapons; dedicated C3 networks to control them; and new delivery units to deliver them. This appears to be the path Pakistan is on. The pure financial cost of such an effort will be substantial. There is no area of competition between India and Pakistan where so much advantage accrues to the former and so many impediments combine to inhibit the latter. Simply put, the financial cost of a tactical nuclear weapon infrastructure is easily within the ability of India to afford but represents another heavy burden for the already fragile Pakistani economy. Any simple—and objective—cost-benefit analysis will show the folly of a South Asian nuclear arms race for Pakistan.

Conclusion

The American experience with tactical nuclear weapons during the Cold War demonstrated the futility of attempting to develop either doctrine or force structure to employ them on the battlefield. In the end, rather than contributing to deterrence by offsetting the conventional military superiority of the Soviet Union, they came to be seen only as a tool to guarantee that a future, more strategic nuclear exchange would follow their use in the event of a Soviet invasion of Western Europe. Their continued presence in Europe is more reflective of their symbolic value of the US commitment to NATO or as bargaining chips for a future deal with Russia to reduce its stockpile, than representative of any genuine military utility. However, until Russia becomes more confident of its conventional military forces and used to an enlarged NATO presence in countries that were formerly part of the Warsaw Pact, the situation will continue to be worrying. Though not deployed, Russia continues to maintain a sizeable stockpile of nonstrategic weapons, ironically for the same reason NATO originally deployed

them in the 1950s and Pakistan is building them today: to offset the conventional military superiority of a perceived foe.

The situation is quickly becoming more fraught in South Asia. Pakistan Army generals, like their Soviet counterparts two generations ago, seem to be imbued with a form of “nuclear romanticism” that tactical nuclear weapons can solve their conventional military imbalance with India.⁸² Possibly within a decade at the present rate of growth, there could easily be a hundred tactical nuclear weapons on the Pakistan side of a very tense international boundary and perhaps half that number on the Indian side if New Delhi chooses to build its own tactical nuclear arsenal. Within two decades there could be several hundred on both sides, and the numbers could continue to grow so long as Pakistan remains a revanchist state committed to redeeming the perceived unfairness of Partition.⁸³ Rather than improving Pakistan’s deterrence of India, these weapons hold only the promise of lowering the nuclear threshold and guaranteeing a larger nuclear exchange by both sides once they are used. In the meantime, they will vastly complicate both security and C3 on the Pakistan side, and at a very high financial cost. The observation of a thoughtful observer writing at the apogee of tactical nuclear weapon deployment in the 1980s remains no less relevant when applied to this looming situation:

Leaving a lot of nuclear weapons scattered around the European theater is like wiring a doomsday machine to a roulette wheel. It does raise the risk of nuclear war, but it cannot raise that risk to one side without doing so for both. That is not a strategy, but the abnegation of strategy. Worse yet, it is likely to prove self-defeating both politically and militarily.⁸⁴

⁸² This term was coined by Richard Weitz to describe the “delusional thinking” among the Soviet military high command that nuclear weapons would allow for a decisive victory over NATO. Weitz, Richard, “The Historical Context”, in Nichols et al (eds.), pp 6 and 31.

⁸³ See footnote 74 for estimated fissile material production rates by India and Pakistan.

⁸⁴ Sigal, pg. 41.

At the height of the second phase of the “Twin Peaks” crisis between India and Pakistan in May 2002, the author asked a Pakistani Major General in the Inter-Services Intelligence Directorate (ISI) if anyone in the Analysis Directorate of that organization had ever assessed what would be India’s response if Pakistan employed a nuclear weapon against it. His answer was not reassuring: “I suppose it would be a massive holocaust”. Somewhat taken about by his unexpected candor, the author suggested that this might be the time to explore the issue in more detail. He simply shrugged his shoulders and replied, “When it’s war, it’s war.”⁸⁵ This echoed an earlier exchange with then-Major General Kidwai on this topic. During a visit to Joint Staff Headquarters by a group of visiting US Air War College students, one of them asked Kidwai if he thought a nuclear war between Pakistan and India was winnable. He answered with the observation that nuclear weapons were not warfighting tools but “instruments of deterrence”. If one side crosses the nuclear threshold, “We don’t know the effect, but we do know it will be a disaster”.⁸⁶ No doubt Gen. Kidwai is correct.

Instead of continuing down the present path of building and field a robust arsenal of tactical nuclear weapons, deterrence stability would be far better served by a tacit agreement by both Pakistan and India to halt the development and production of—and to foreswear the deployment of—such weapons on their territory as a useful and very simple confidence building measure. This would not only save of needless expenditure by both sides, it would maintain the present level of deterrence, and promote increased crisis stability in the event of a future—and unfortunately inevitable—crisis between the two sides.

⁸⁵ Meeting with the author at ISI Headquarters in Islamabad, 30 May 2002.

⁸⁶ Briefing at Joint Staff Headquarters in Rawalpindi on 13 May 2001. The author was in attendance.