Strategy Research Project

The Atomic Army: A Case Study in Strategic Landpower

by

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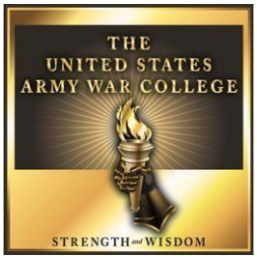

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In the mid-1950s, the U.S. Army became the world's first landpower trained and equipped to deliver nuclear fires on the battlefield. Within a decade the Army operated ten different nuclear weapons systems, even though by then their strategic rationale had sharply eroded. For a time, industry's ability to design ever smaller and more sophisticated weapons outstripped their operational rationale. Yet soldiers and leaders at unit level continued to maintain these complex systems for field artillery, air defense artillery, atomic demolition munitions and intermediate-range ballistic missiles. They devised solutions to the problems of sharing the technology with allies and the Reserve Components and securing the weapons on foreign soil. Soldiers continually innovated as new and improved systems became available and maintained these capabilities through decades of rapid change, including non-nuclear conflicts, the transition to an All-Volunteer Army and racial and gender integration. The Army adapted its personnel management, training, security and maintenance systems at enormous cost. Not until the end of the Cold War did the president finally direct the Army to stand down from this demanding mission.

The Atomic Army: A Case Study in Strategic Landpower

In the waning days of the Korean War, the U.S. Army became the world's first "atomic army," capable of delivering tactical nuclear weapons above, on and below an atomic battlefield. Over the next four decades the Army trained and equipped itself for this challenging mission using more than a dozen types of weapons. This essay examines how the Army innovated to use this new technology, how it incorporated the weapons into its organizations, trained and led its soldiers to deliver nuclear fires, and provided support to allied armies, while safely maintaining and securing these weapons in the United States and overseas. The Army had served as midwife to the atomic age through the Manhattan Project, but for several years after 1945 the only service capable of delivering such weapons was the newly independent U.S. Air Force. During the Korean War the Army was limited to using only the conventional weapons of the previous war to fight against massed infantry formations. However, by 1953 the Los Alamos National Laboratory had developed smaller warheads that the Army could deliver on the battlefield.[1]

The history of the Army as a battlefield nuclear force has not been told in detail, certainly not beyond the first decade. Missing from most scholarship is how the Army actually organized and trained to deliver nuclear fires, as opposed to discussions of policy and doctrine. The political scientist Robert Jervis commented in 1991: "Because of their perceived importance, novelty, and menace, strategic nuclear weapons have generally held our attention. There are fewer studies of the confused programs for tactical nuclear weapons. . . . A more complete picture will require scholars to fill in these large areas."[2] This essay is intended to contribute towards the scholarly effort that Jervis called for a quarter century ago.[3]

This history has some contemporary relevance. At some point in the future the Army might have to fight on a nuclear battlefield, or under the shadow of the use of tactical nuclear weapons. Richard Hart Sinnreich recently lamented the Army's "loss of doctrinal attention and institutional learning" relating to the employment of tactical nuclear weapons since the end of the Cold War. He disavows any desire to turn the clock back. "But neither budget nor force structure limitations prevent us from thinking about, writing about and war-gaming the battlefield nuclear problem. . . . Study and learning are one form of military effort that costs relatively little."[4]

The Army's success in maintaining combat readiness for decades in an environment of strict standards should not be taken for granted, as the Air Force has learned in recent years. In 2014, the Secretary of Defense directed an independent review of the Department of Defense nuclear enterprise that uncovered a wide range of troubling problems in the Department of the Navy and Air Force. The review was a painful reminder of the difficulty of maintaining readiness and safety over an extended period under difficult circumstances.[5]

This essay is also intended as a case study of innovation. The Cold War Army was a learning organization from beginning to end, continually fielding innovative equipment, organizations, doctrine, training, leadership, and personnel management over the course of four decades. The Army's development of air mobility and counterinsurgency are two well-known examples of this kind of peacetime innovation. However, less well known is the Army's transformation during those same years into a powerful force capable of delivering nuclear fires on the battlefield. The current *U.S. Army Operating Concept: Win in a Complex World* (7 October 2014) lists innovation as

one of the tenets that must “guide the generation and application of combat power.”[6] The history of the “Atomic Army” during the Cold War can offer insights into how the Army might innovate in the future, not only in the nuclear arena, as it seeks to anticipate and prepare for new technologies and novel domains of conflict.[7]

Big Guns: Fitting New Technology into Familiar Organizations

By the end of the Korean War the Los Alamos National Laboratory had developed warheads suitable for delivery by traditional artillery, beginning with a warhead for the 280-mm cannon in 1952, followed by an 8-inch (203-mm) howitzer in 1957, and the 155-mm howitzer in 1963. These weapons were commonly called Artillery Fired Atomic Projectiles (AFAP). These type weapons were not difficult for the Army to adopt. The Army organized battalions and trained the artillerymen how to handle and fire the new projectiles. The M-65 280-mm cannon was based on the 240-mm howitzer that the Army had fielded during World War II. The 280-mm cannon, the proud symbol of the Army’s new atomic capability, appeared in President Eisenhower’s inaugural parade in Washington, DC, in January 1953. On May 25, 1953, Battery B, 867th Field Artillery Battalion successfully fired the first live 15-kiloton atomic projectile at the Nevada Proving Ground at a range of seven miles.[8]

The Army deployed two battalions of 280-mm cannons to Germany in 1953 and a third in April 1954. Two other battalions stayed in the continental United States. At first each battalion had three batteries of two guns each. To underscore that this was a real capability, one of the battalions in Germany test-fired the 280-mm cannon at Baumholder with a conventional projectile on April 21, 1954. The Army eventually deployed six 280-mm battalions to Germany, one to each corps, the other four assigned

to Seventh Army Artillery in the 42d Artillery Group, which was activated in Nellingen, Germany, on January 2, 1953. Another battalion deployed to South Korea in 1958.[9]

The M-65 was an ungainly beast, weighing 85 tons and moved with wheeled tractors at each end of a long carriage and emplaced with hydraulic jacks. The Army built only twenty. With precise position survey, the guns could deliver accurate conventional and nuclear fire out to 18 miles. Drivers could squeeze through narrow German streets only with great difficulty. During Seventh Army maneuvers in southern Germany in February 1959, one tractor lost its brakes going down a steep slope, crashed into an Army car and another 280-mm cannon and caught fire, killing one soldier and injuring others.[10] The cannon was involved in one last fatal accident in 1964, just as it was being withdrawn Germany. According to one report, "'Atomic Annie' and its tractor slid off a mountain road killing two Soldiers and wrecking the prime movers."[11]

To maintain and secure the special ammunition the Army created special munitions units and storage facilities in forward-deployed locations. The Army established a special weapons ordnance unit in Heilbronn in spring 1954, but does not appear to have deployed the 280-mm atomic projectiles to Germany until April 1955.[12]

Seventh Army recognized that these delivery units required extra security forces. General Matthew B. Ridgway warned in 1956:

> . . . [T]hese are vulnerable weapons. They are not easy to conceal. They would be object of the enemy's most intensive intelligence efforts. He would go to any lengths to locate and destroy them, and the destruction of one [280-mm] gun would leave a great gap in our lines that only fighting men could fill.[13]

In 1959, when 2d Lt. Colin L. Powell served in his first duty assignment with the 3d Armored Division in Gelnhausen, Germany, his company commander selected Powell's platoon for this mission. As he later recalled, "The Russians obviously wanted

to know where our 280s were so that they could knock them out if and when they attacked. Consequently, the guns were always guarded by an infantry platoon as the trucks hauled them around the German forests to keep the Soviets guessing. . . .” Powell eagerly alerted his platoon for “a secret mission…I was excited; I was going to guard a weapon that fired a nuclear warhead!”[14]

Over the next few years the Army combined the 280-mm cannon with another dual-capable system, the M-31 Honest John rocket, into hybrid battalions and finally inactivated the last 280-mm firing unit in about 1964. By that time the Army had two other tube field artillery systems available to deliver battlefield nuclear weapons. Much easier to employ than the 280-mm cannon was the 8-inch howitzer, for which the Army fielded atomic projectiles in the mid-1950s. At first the Army used the self-propelled M55 howitzer, which was replaced by the M110 self-propelled howitzer from 1963 onwards. By the late 1950s, division and corps artilleries had mixed battalions of 8-inch howitzers and Honest John rockets to deliver nuclear fires. In 1963, the Army deployed nuclear warheads for an even more common system, the 155-mm howitzer (see below).

Rockets and Missiles: New Weapons, New Organizations

Cannons and howitzers were familiar to artillerymen; atomic projectiles were little more than new ammunition for existing systems. Rockets and missiles were entirely new. Starting in the mid-1950s soldiers and their leaders had to create new organizations and training programs for a series of these nuclear-capable weapons, ranging from the solid-propellant Honest John, fired from the back of a standard Army truck with a range of 25 miles, to the two-stage, liquid-fueled Redstone with a range of 200 miles. The Army eventually fielded about ten different rocket and missile systems.[15]

The first such system was the M-31 Honest John, a 762-mm rocket that could be fired from a standard 2½ ton truck (later redesignated MGR-1). Soldiers trained on the Honest John at Fort Sill and White Sands Proving Ground, where it was field tested in early 1954 under simulated tactical conditions. The Honest John was initially attached to 280-mm cannon battalions, but by 1956-57 they were reorganized into separate battalions, each with a single firing battery. The first version of the rocket could reach 16 miles, while an improved version M-50 (later redesignated MGR-1B) introduced in 1961 could reach 25 miles. These rockets were eventually assigned to every Army division and corps and purchased by several allies.[16]

The Honest John was relatively simple for soldiers to maintain and employ. Soldiers could drive it to any launch point the carrier could reach and could aim it as they would any other artillery piece. However, soon the Army began to field more complex missile systems that required considerably more technical training. Never before had soldiers in line units been required to employ such complex systems that came with liquid propellant, radar, and complex electronics. The early generations were tricky and difficult to employ, but American defense contractors worked to create easier and safer systems for soldiers that used solid propellant.

The MGM-5 Corporal missile was an order of magnitude more challenging to employ than the Honest John. It was a 45-foot long, liquid-fueled guided missile with a range of 75 miles that could deliver a nuclear warhead of up to 47 kilotons. It was first issued to operational units in July 1954 and deployed to Germany in February 1955. The Army activated and deployed several Corporal battalions: two at Fort Sill, one at Fort Bliss, one at Fort Carson, six to Germany and two to Italy. The British Army of the

Rhine fielded the system in two Royal Artillery guided weapons regiments. Each firing battery included a guidance platoon to direct the missile in flight. Soldiers proved they could operate tricky liquid-fueled guided ballistic missile systems in a tactical environment. On March 15, 1952, the Army activated the 246th Field Artillery Battalion (Corporal) at Fort Bliss as the first TO&E missile battalion. The battalion underwent the Army Training Program from August 1953 to March 1954. On March 18, 1954, it became the first tactical unit to fire a Corporal missile at White Sands.[17]

In late fall 1955, personnel from the Jet Propulsion Laboratory, which had developed the missile, accompanied the 246th Field Artillery Battalion to participate in Operation Sagebrush, field maneuvers in Louisiana that simulated firing and displacement. General Maxwell D. Taylor, Army Chief of Staff, was reportedly "not pleased with Sagebrush's overall missile performance, stating, '[W]e 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.' Taylor concluded that the Army had 'a long way to go before we understand the problems of using these weapons.'" In January 1956, the battalion was transferred to Fort Sill, where it became the post's first Corporal missile battalion.[18]

The increased range and striking power of the Honest John and Corporal caused the Army to organize special commands for delivering an atomic "punch." The 1st Missile Command was activated on December 25, 1957 in northern Italy and became the nucleus for the Southern European Task Force (SETAF). Two other missile commands were activated in the United States in the same year, the 2d at Fort Hood

(later transferred to Fort Carson), and the 3rd at Fort Bragg. The 4th Missile Command was activated April 18, 1958 in South Korea.

In the 1950s, the Army did not commit significant ground forces to the defense of Italy. Instead it created SETAF on October 2, 1955 to provide “Army nuclear fire support to NATO forces south of the Alps.”[19] The Army built SETAF, headquartered in Verona, around the 1st Army Missile Command and its Honest John rockets. Although SETAF’s strength rose to about 10,000, it did not add an infantry component until 1973. Its first commander was the highly regarded Brig. Gen. John H. Michaelis, a decorated hero of World War II and Korea. SETAF soon added the Corporal missile to its punch.[20]

The Army developed a new missile, the MGM-29 Sergeant, to replace the Corporal and began to transition Corporal units to Sergeant in 1962. The last U.S. Corporal battalion was inactivated by June 1964 and the last British unit by 1966. The Sergeant used solid propellant and with a length of 35 feet was substantially shorter than the 45-foot Corporal. It could carry a conventional or nuclear warhead, up to 150 kilotons. According to one historian, “Although the equipment was deficient in many respects, the Sergeant was the first missile system to have a degree of automation designed into it for testing, firing, troubleshooting, and maintenance.” By 1964, the Army had fielded seven Sergeant battalions in support of corps and theater armies: four in Germany, and one each in Italy, Korea and Okinawa. The only foreign army to acquire it was the Bundeswehr, which fielded four battalions.[21]

The Sergeant missile was eventually replaced by the MGM-52 Lance missile. The first Lance battalion activated at Fort Sill in April 1972 and the new missile,

mounted on a tracked carrier, started replacing both the Sergeant missile and Honest John in 1973. The Army phased out the last Sergeant battalion in 1977.

Sometimes the Army acquired systems that were not very effective. In 1960, the Army fielded the MGM-18 Lacrosse, an overly complicated system that the Marine Corps had initially backed, but then dropped. The system had a troubled developmental history, but the Army agreed to purchase and field eight battalions. The missile could be launched from a 2-1/2 ton truck and could deliver a conventional or nuclear warhead up to 20 miles. A forward observer could guide the missile electronically to its target, but the system was susceptible to electronic countermeasures. The Army fielded the weapon to West Germany, South Korea and elsewhere in the Pacific region, but withdrew it from service by 1963, making it the most short-lived of all Army nuclear-capable systems.[22]

The extended ranges of rockets and missiles caused the Army to search for adequate firing ranges. Units in the United States traveled to the White Sands Missile Range for annual service practice. Units overseas faced greater challenges. In 1968, NATO established the NATO Missile Firing Installation on Crete. Soldiers assigned to Sergeant, Lance, and Nike-Hercules, and HAWK units in Germany and Italy looked forward to their annual visit to Crete for service practice.

Deploying Overseas and Sharing with Allies

The Army soon faced two novel issues: how to station these weapons on foreign soil and how to share them with allied armies. The arrival of nuclear-capable delivery systems overseas in the 1950s was a highly visible statement of U.S. intent and widely covered in the U.S. and foreign press, although the movement of the actual warheads was done in secrecy. When the Eisenhower Administration ostentatiously deployed the

280-mm cannon and Honest John rockets to South Korea in early 1958, their arrival was covered in the weekly Universal Newsreel broadcast.[23] The Army activated the 4th U.S. Army Missile Command in South Korea on April 18, 1958, and the 38th Artillery Brigade (Air Defense), with headquarters at Osan Air Base in 1961.

Countries such as West Germany, which joined NATO and began to rearm in 1955, eagerly sought U.S. nuclear weapons, while others refused to have them stationed on their soil. The attitudes of allied governments and populations had a great influence on stationing and employment decisions. This meant that the U.S. Army had to be prepared to carry out its missions with or without these weapons, depending on host-nation policies. Within NATO, France was intent on developing its own nuclear capability and stood firm against U.S. storage, even though France already was home to much of the U.S. military logistical resources, several air bases, and operational depth. Denmark rejected U.S. nuclear weapons, although it did allow the U.S. to deploy the dual-capable Nike-Hercules system in 1959 to defend the Thule Air Base on Greenland until 1965. Japan, the world's first victim of atomic attack, declined to host nuclear weapons. But the U.S. had stored large numbers of nuclear warheads in the Ryukyu Islands during the years when it administered the islands. When the islands reverted to Japan, the U.S. removed all its weapons by June 1972.[24]

The United States sometimes deployed overseas dual-capable delivery systems that may or may not have been accompanied by nuclear warheads. For example, during the Quemoy-Matsu crisis in 1958, the U.S. sent 8-inch howitzers to Quemoy and deployed the dual-capable 2d Missile Battalion, 71st Artillery (Nike-Hercules) to Taiwan to defend Taipei. The U.S. Nike-Hercules battalion trained the Republic of China Army

to use the system and was inactivated 15 August 1959. Declassified U.S. government documents seem to indicate the deployment of some nuclear weapons to Taiwan, but in the 1970s the Nixon Administration quietly withdrew all remaining U.S. nuclear materials in recognition of the growing détente with Red China.[25]

Just as the U.S. Army trained on these new systems, it also provided training to allied armies, particularly for rocket and missile systems. Foreign officers and enlisted specialists became a common sight at Fort Sill, Fort Bliss and White Sands. The U.S. decision to arm West Germany with dual-capable units came during the Berlin Crisis of 1958-62, but the actual warheads remained in U.S. custody.[26] For this purpose, the Army innovated by developing procedures and organizations for training and equipping allies, then developed procedures to deliver the warheads as well. Actual U.S. custody on foreign soil was often the responsibility of small teams of U.S. Army officers and noncommissioned officers in remote weapons storage sites. Custodial officers often received language training at the Defense Language Institute before going overseas.

In 1955, Seventh Army organized the 71st Ordnance Group in Germany to administer and control special weapons in the region and around the same time the Special Ammunition Support Command (SASCOM). In 1962, Seventh Army reorganized the group as the 59th Ordnance Group, Advanced Weapons Support Command (AWSCOM) and in 1972 consolidated it with the SASCOM (in 1977, the 59th Ordnance Group was redesignated a brigade). Its missions included maintenance, security and custody. The group controlled detachments in support of allied field artillery and Nike-Hercules units in NATO countries. According to the current unit history:

> The 59th Ordnance Brigade was composed of 8 battalion-sized units: 2 ordnance battalions, 5 artillery groups, and a headquarters support

> battalion. Consisting of more than 6,500 personnel, Brigade units were located in 35 cities and towns throughout the Federal Republic of Germany and the Netherlands. The ordnance battalions supported U.S. units, while the artillery groups supported the NATO countries of the Federal Republic of Germany, the United Kingdom, Belgium, and the Netherlands, exercising interoperability on a daily basis to accomplish the common mission. The 59th Ordnance Brigade combined two missions, the ordnance and the artillery, and performed a mission that was the backbone of the NATO alliance.[27]

The U.S. maintained custody of nuclear warheads for the British Army of the Rhine starting about 1958, including for the Corporal missile, the only foreign army to adopt this weapon. Other U.S. systems used by the British Army may have included the 8-inch howitzer, Honest John, atomic demolition munitions (ADMs), 155-mm howitzer and Lance.[28]

U.S. Army weapons detachments also supported the Canadian Army in Germany with warheads for the Honest John and possibly for howitzers. This may have included the 1st Canadian Surface to Surface Missile Battery and the 1st Regiment, Royal Canadian Horse Artillery, from 1964 to 1970.[29]

Maintaining custody and security of U.S. warheads in a foreign country could be challenging. As early as 1960 the Joint Committee on Atomic Energy investigated U.S. forces in Europe and expressed concern over custody arrangements for U.S. weapons provided to NATO allies.[30] During the same years the Korean peninsula remained tense. During the crisis from 1966 to 1969, North Korean commando units infiltrated into the south. In January 1968, a thirty-man commando unit slipped through the demilitarized zone in the sector of the U.S. 2d Infantry Division and reached the Blue House in Seoul, residence of the South Korean president, before being detected and repulsed. Around that time the U.S. Army had deployed on the peninsula several nuclear-capable units, include 155-mm and 8-inch howitzers, Honest John rockets,

Sergeant missiles, ADMs, and Nike-Hercules air defense missiles. According to one account: “The backup U.S. 7th Infantry Division . . . found itself stretched thin as it guarded various nuclear weapon sites, defended the U.S. Embassy in Seoul, and provided an on-call QRF [quick reaction force] for I Corps (Group).”[31]

Within NATO, the U.S. had stationed nuclear weapons in Greece in the early 1960s, but in April 1967 Greek army officers staged a coup, raising American concerns about the security of the U.S. weapons.[32] In July 1974, Greece and Turkey, both NATO member states that hosted U.S. nuclear weapons, went to war over Cyprus, causing more tense moments for U.S. custodial personnel and the chain of command. According to an American account of a standoff at one air base:

> The local Army troops outside the fence wanted in. Their Air Force countrymen inside wanted them kept out. The nukes on alert aircraft were hastily returned to bunkers as the opposing commanders parleyed under a white flag. Soon both sides went off to dinner, but through it all we held our breath.[33]

The Army maintained nuclear weapons on foreign soil and provided training and custodial detachments in support of allied armies until the end of the Cold War. Despite episodes of instability, armed attack and terrorist threats, not a single U.S. weapon in Army custody was ever seized or damaged. U.S. soldiers and their leaders may have held their breath on occasion, but they accomplished their overseas mission for more than three decades.

“Into the Hands of Even Battalion Commanders”

As with other innovations, the Army sought the optimal organizational level for the new systems. Should they be retained at the level of theater army or corps, or proliferated down to lower levels? These questions became most acute in the early 1960s with the development of several types of weapons: atomic demolition munitions

(ADMs), the Davy Crockett, weapons for air deployable formations and the 155-mm howitzer. In two of these cases, the Army deployed the systems, then in a few years decided to remove them. In 1959, President Eisenhower, himself an experienced wartime theater commander, “wondered at the necessity of putting atomic weapons throughout ground forces and into the hands of even battalion commanders.”[34] President Kennedy, troubled by the Cold War crises in 1961-62, insisted on new controls. Yet the impressive inventiveness of the national’s nuclear weapons base made it possible to create ever smaller weapons, which Army leaders embraced as a counter to the masses of Soviet and Chinese combat power. Nuclear weapons were incorporated into engineer barrier plans in Europe and were placed into the hands of infantry, armor and airborne battalion commanders. During the 1960s the total number of U.S. nuclear weapons stored in Europe grew from about three thousand to about seven thousand, most of them Army systems.[35]

By the late 1950s the Army had medium atomic demolition munitions (MADMs), small weapons designed to be detonated underground to create barriers to maneuver. U.S. Army Europe incorporated them into its barrier plans and divisional engineer battalions began fielding ADM platoons in about 1963. Within a few years the Army had special ADMs (SADMs) that were man-portable. In some cases Special Forces “Green Light” teams trained to employ SADMs behind advancing Warsaw Pact lines to disrupt their forward movement. The risky employment concept troubled soldiers and their leaders. One Special Forces veteran recalled how he would have detonated the SADM from a “safe” distance: “We’re outside the vaporization range, but well within the ‘I will feel the wonderful warm wind that will blow by when it goes off in a second’ range.”[36]

In March 1973, the Joint Committee on Atomic Energy visited Europe and expressed concerns for the security of weapons stored in forward or isolated areas, including an excessive number of ADMs that were stored in forward special ammunition sites, “although the atomic demolition munitions were probably not usable because of extensive political constraints. . . .”[37] If ADMs were essential to NATO barrier plans, but release authority was not received until days after any Warsaw Pact attack, then how realistic were the plans? Despite these qualms, the Army maintained these systems in its inventory until the late 1980s.[38]

In 1979, the TRADOC commander, General Donn A. Starry, cautioned the Army deputy chief of staff for operations:

> In their present configurations ADMs consume inordinate resources – personnel, security, training. They are a considerable administrative burden. Especially is this so when they are deployed overseas. Burdensome physical security requirements, convoluted personnel requirements, and the difficulty of assigning and keeping trained personnel all militate strongly against keeping ADM in the force under present schemes for their deployment, employment, and training of employment teams.[39]

Following the thinking that atomic weapons were just another type of fires, the Army deployed the M-28 Davy Crocket recoilless rifle to infantry and armor battalion commanders beginning in 1961, soon followed by the heavier M-29 version. These weapons delivered low-yield warheads from 0.01 to 1.0 kilotons to about a mile and a quarter. They could be fired dismounted from a tripod, jeep, or M-113 armored personnel carrier. Under the Pentomic organization, each battle group fielded a Davy Crockett section with three jeep-mounted launchers and twelve warheads. Soldiers called it the “hand gre-nuke.”[40]

In July 1962, a battalion task force of the 1st Mechanized Battalion, 12th Infantry, from the 4th Infantry Division traveled from Fort Lewis to the Nevada Test Site to demonstrate tactical employment of the Davy Crockett and conduct a live-fire exercise. Senior government officials observing the exercise included Attorney General Robert F. Kennedy. A film of the event, declassified and released to the public many years later, shows soldiers employing fire and maneuver, to include tanks, 105-mm howitzers, and 4.2-inch mortars. The Davy Crockett section then dismounted their M-113, set up and fired the weapon, which detonated with an impressive blast.[41]

According to Daniel P. Bolger, “Crews drilled with inert substitute warheads and practiced driving to planned wartime firing positions. When alerted, the Davy Crockett crews drew their assigned nuclear devices and moved out. If the balloon went up, the young soldiers knew where to go.” The weapons were never fitted with permissive action link (PAL) devices. “Instead, they relied on the trust placed in their fresh-faced crews. It was enough. In almost a decade of dispersed operations, including the 1961 Berlin Crisis, the 1962 Cuban Missile Crisis and a succession of alerts, dry runs, and false alarms, not one Davy Crockett was lost or misused.”[42]

In 1962, the West German defense minister pushed for Davy Crockett for Bundeswehr formations, but the United States declined.[43] The Army withdrew the systems from its own formations by 1967 and retired the weapons by 1971. The Army has never stated publicly why the weapons were removed, but it is easy to deduce some possible reasons. They could not be secured with PAL devices, but especially because they were too close to the front lines. National command authorities refused to pre-delegate release authority and front line commanders would not have had sufficient

time to obtain release authority before they might be overrun. This ended the Army's experiment with putting small nuclear weapons in the hands of battalion commanders.

General Frederick J. Kroesen, who had commanded the V Corps and U.S. Army Europe, later remarked: "The Davy Crockett was discarded, with no objection from the infantry commanders who had been overwhelmed by the regulatory system they had been saddled with, and with little complaint from the purveyors of doctrine."[44]

Weapons security was a constant concern, and not just from enemy forces. As an officer with an 8-inch howitzer unit in Germany in the late 1950s described:

> Security was an additional problem. Long before the McNamara era's permissive action links (PAL) and NATO-centralized nuclear weapons storage sites, each nuclear-capable field artillery battalion stored its atomic weapons more or less as it saw fit. There were few economies to be found under this system, and the security costs to an already overburdened unit were high, but suffice it to say that no weapons were compromised during this period.[45]

The Kennedy Administration insisted on placing locking devices on most nuclear weapons. The Army initially resisted the deployment of these devices, perhaps arguing that the military chain of command was sufficient to ensure weapons would only be used with due authority. The Secretary of Defense was not convinced and directed in June 1962 that all weapons deployed to Europe be retro-fitted with the locking devices. The unlock codes would be retained by the theater commander. The new PAL systems required dedicated and secure communications channels from the theater commander down to individual firing battery level to convey emergency action messages and the unlock codes.[46]

In about 1962, Headquarters, U.S. Army Europe created the U.S. Army Control Detachment, the U.S. Army Surveillance Detachment, and the U.S. Army PAL Surveillance Detachment, which in December 1963 were re-organized into the U.S.

Army Permissive Action Link Detachment assigned to Headquarters, U.S. Army Materiel Command, Europe. The detachment was attached to the Advanced Weapons Support Command for administrative and logistical support.

Army planners also sought to embed tactical nuclear weapons in light and airborne forces. The designers of the truck-mounted Honest John rocket soon created a smaller version, the MGR-3 Little John, that could be transported by rotary and fixed-wing aircraft. The Little John systems were first deployed in November 1961 to the 1st Missile Battalion, 157th Field Artillery on Okinawa, and that fall the Little John replaced the Honest John in four other rapid-deployment divisions: the 82d Airborne Division, 101st Airborne Division, 4th Infantry Division and 24th Infantry Division.[47]

Light and airborne units also received the Davy Crockett system. However, by the late 1960s it was clear that the Army's light forces were not likely to be committed in theaters that would call for tactical nuclear weapons, or the required nuclear fires could be provided from the air or by other sources. The Little John was declared obsolete in 1969.[48]

In the early 1960s, the self-propelled 155-mm howitzer became the standard direct-support artillery weapon in the new heavy divisions organized under the Reorganization Objective Army Division (ROAD) concept. In 1963, a 155-mm atomic projectile became available and it was soon deployed to Europe and the Pacific. With variable yield from 0.02 to 0.04 kilotons, it had similar power to the Davy Crockett, which it replaced. The Army took this capability out of the hands of infantry battalion commanders and placed it instead in field artillery units. Another impact of adding a 155-mm capability cause the Army to more than double the number of field artillery units

that were dual-capable. It also posed a dilemma to enemy commanders, now that every firing battery was potentially a nuclear delivery unit. U.S. Army Europe was now fully ready for the NATO strategy of Flexible Response, adopted in 1967.

Sharing with the Army National Guard

By the early 1960s, the Army began to share this new category of weapons with the Army National Guard. But this raised issues of whether or not to give custody to the National Guard. Army National Guard and Army Reserve field artillery units were trained for 8-inch howitzer and 155-mm howitzer nuclear operations, although the Active Army would have been challenged to certify these nuclear delivery units upon mobilization. However, in one area the Reserve Components played a major role.

The National Guard had shared the continental air defense mission with the Regular Army since World War II. During the Korean War, some nineteen National Guard gun battalions were activated to defend major cities. A few years later National Guard units began to employ the conventionally armed Nike-Ajax missile system. When the Army deployed the dual-capable M-6 Nike-Hercules system, the National Guard agreed to serve with it. The Nike-Hercules system (later redesignated MIM-14) was complex and could be dangerous. For example, on May 19, 1959, a non-nuclear explosion killed three active duty soldiers from D Battery, 1st Missile Battalion, 65th Artillery, at Naha, Okinawa. The battalion commander and three other soldiers were awarded the Soldiers Medal for their rescue efforts.[49]

The first National Guard unit to become operational was in Hawaii, where the 298th Infantry Regimental Combat Team was converted to the 298th Anti-Aircraft Artillery Group. The unit trained in New Mexico in 1959 and became operational in Hawaii on 4 March 1961. National Guard units used a mix of National Guardsmen and

dual-status military technicians, federal civil service civilians who were cross-enrolled in the National Guard. In December 1961, the Secretary of Defense “approved the deployment of Nike Hercules warheads to ARNG SAM sites, provided custody will be with members of the U.S. Armed Forces on active duty.”[50]

The National Guard developed an arrangement by which the batteries would be operated by a mix of full-time and part-time soldiers, while the actual warheads would remain in the custody of Regular Army officers:

> In order to meet the 24 hour “watch” requirement, a skeleton force, employed as civilians, would man each site on a fulltime basis. In the event of an emergency, all members of the unit would be ordered to active duty by the President and would report directly to battle stations from their homes or civilian jobs.[51]

By 1965, the National Guard operated 54 Nike-Hercules missile batteries around the country, almost half of all sites in the continental United States, under the direction of the Army Air Defense Command (ARADCOM). Soldiers in the continental United States traveled to New Mexico for annual service practice, while Hawaii units conducted annual service practice at the Kahuku guided missile range.[52]

Regular Army units operated other Nike-Hercules sites in the continental United States and overseas. For example, in 1962 twelve active duty Nike-Hercules batteries deployed to the Homestead-Miami area in October and November 1962 during the Cuban Missile Crisis, but apparently brought only conventional warheads.[53] In Europe, the 32d Army Air Defense Command deployed six Nike-Hercules battalions, along with short-range HAWK batteries. Other active duty Nike-Hercules batteries included units stationed in Okinawa, South Korea and Alaska.[54]

The Army activated the 4th Battalion, 55th Artillery at Thule, Greenland, with four firing batteries on September 1, 1958. This unit likely had nuclear warheads, even

though the Danish government did not accept nuclear weapons in Denmark proper. The United States withdrew the battalion in May 1965.[55]

By the late 1960s, the Army faced severe manpower shortages. In February 1969 the Joint Chiefs of Staff "recommended approval of the transfer of custody of nuclear weapons to ARNG Technicians at ARNG Nike Hercules sites." In February 1970, President Nixon "approved transfer of custody of nuclear weapons at National Guard Nike Hercules sites from Army active duty custodians to National Guard custodians who were employed by the Federal Government." This saved the Army an estimated 280 Active Army personnel and $2.3 million annually.[56]

ARADCOM began to close some Nike-Hercules sites in the mid-1960s; the sites in Hawaii were deactivated in 1970. By the time the United States and Soviet Union signed the Anti-Ballistic Missile Treaty in May 1972, the threat of Soviet intercontinental ballistic missiles had replaced the fear of swarms of Soviet bombers. Meanwhile, the Army continued to experience severe pressure on its manpower:

> On 13 August 1973 the Secretary of Defense directed the Army to reduce its Reserve Components by 48,000 spaces and, in a realignment of strategic defensive forces, to eliminate its National Guard Nike-Hercules Air Defense units (twenty-seven firing batteries and eleven headquarters batteries), a loss of 4,500 additional spaces. By the end of the fiscal year inactivation of the air defense units was well under way, but the 48,000-space reduction was deferred pending resolution of congressional opposition."[57]

The last Nike-Hercules units in Florida and Alaska were inactivated in 1979. On July 31, 1979, the 1st Battalion, 43d Air Defense Artillery was inactivated at Fort Richardson, Alaska, the last Nike-Hercules unit in North America. National Guard historian Michael D. Doubler concludes:

> Guardsmen established themselves as a readily accessible asset, fully capable of participating in the first line of defense against the nation's

> most dangerous threats. . . . Guardsmen proved themselves [capable] of quickly and confidently mastering high technology weaponry. ARNG air defenders at Nike-Ajax and Nike-Hercules sites debunked the myth that citizen-soldiers could not master the intricacies of new, computer age weapons.[58]

Strategic Landpower: Theater Ballistic Missiles

The Army activated its first intermediate-range missile units in 1958. The liquid-fueled PGM-11 Redstone missile was similar to the German V-2 rocket with a range of 200 miles. The Army's first truly ballistic missile was assigned to a theater or field army. On June 2, 1958, soldiers of the 40th Field Artillery Missile Group (Heavy) conducted the first operational firing of the Redstone at White Sands Missile Range. On July 31, 1958, it carried a live nuclear warhead for a test in the Pacific. The Army activated three Redstone missile groups. The 209th Artillery Group (with 4th Battalion, 333d Artillery) remained at Fort Sill, while the 40th Artillery Group (1st Battalion, 333d Artillery) and 46th Artillery Group (2d Battalion, 333d Artillery) deployed to Germany.[59]

In 1964, the Army replaced the Redstone with the solid-fuel MGM-31 Pershing missile. The Army deployed the Pershing to Germany in 1964 to replace the Redstone. In April 1963, the 56th Artillery Group was activated at Schwäbisch Gmünd. Germany was the only other country to deploy the Pershing. The Luftwaffe activated two battalion-sized Pershing missile wings in about 1966.[60]

In December 1965, the Supreme Allied Commander Europe placed these Pershing units on quick-reaction alert (QRA) status, a function that previously had only been performed by the Air Force and Navy. Firing batteries from U.S. Army Europe's three Pershing batteries in Germany alternated on standby status.[61]

Pershing units remained in a relentless cycle of training, readiness and testing, which included rotating to the United States for annual service practice. An experienced

Pershing officer, writing in the *Field Artillery Journal* in 1977, described QRA status in these words:

> In support of that mission, a significant portion of the brigade's missile assets, located at remote firing sites, remains on constant alert. It is this duality of mission, the size of Pershing units and the state of readiness which much be maintained that make an assignment to the brigade the ultimate in challenge and responsibility, short of combat, that a field artilleryman can face.[62]

In 1969-70, the Army fielded an upgraded Pershing Ia and increased the number of launchers in each battalion from 8 to 36 with nearly 1,500 men and 400 vehicles. The brigade now included an infantry battalion for security.[63] On September 18, 1970, the 56th Artillery Brigade became the 56th Field Artillery Command (Pershing) until 1972, when it reverted to a brigade. In 1983, the Army deployed an even more lethal variant, Pershing II, to Germany (see below).

Personnel Management and Training

The introduction of nuclear weapons into the Army required many changes in personnel management and training policies. When the Army began this transformation in the 1950s, it was a conscript-based enlisted force led predominantly by Regular Army noncommissioned officers. Most junior officers were commissioned through ROTC and were not career officers. In turn they were led by mid-grade Regular Army officers. Many of the career officers and noncommissioned officers were veterans of World War II and the Korean War.

For technical training on weapons maintenance, assembly and firing, soldiers were trained by the Atomic Weapons Training Group (later the Defense Nuclear Weapons School), at Sandia Laboratory, Albuquerque, NM. Courses in maintenance and employment of missile systems was conducted at Fort Bliss, Fort Sill or White

Sands. The Army rapidly developed a cadre of enlisted maintenance technicians and warrant officers for these systems.

The Army established a course for nuclear weapons employment at Fort Sill, Fort Bliss and Fort Leavenworth that awarded the Prefix 5 specialty identifier to officers, especially those attending the field artillery and air defense artillery officers advanced courses or the command and general staff officers course. In 1953, NATO established a school in Oberammergau, Germany, that included a two-week course for NATO staff planning and procedures for nuclear war.[64]

The Army also experienced a rapid increase in the number of security clearances required for a variety of unit and staff positions. Officers, noncommissioned officers and selected enlisted personnel received a Secret clearance. Others received a Top Secret clearance. Furthermore, the Atomic Energy Commission awarded a Q clearance, equivalent to Top Secret for nuclear weapons information. Other information was classified as Restricted or Formerly Restricted Data if it related to weapons design information.

Security clearances were not enough. The Army also established the Army Nuclear Surety Program, “designed to ensure the safety, security, reliability and survivability of Army operations in support of DOD’s nuclear weapons program.”[65] The Department of Defense also directed an additional layer of control know as the Personnel Reliability Program (PRP). This placed special controls over soldiers with access to nuclear weapons to ensure their “reliability.”

By the end of the Vietnam War the Army faced an epidemic of drug abuse and the Army began a mandatory urinalysis program, which disqualified many soldiers from

nuclear-related duties. As late as the 1980s this continued to be a factor. The Defense Department's annual nuclear surety report to congress stated:

> In 1985, the DoD had a total of 101,588 certified personnel in the PRP. . . continued observation and evaluation of each individual resulted in 3,992 or 3.24 percent being decertified in 1985. Since 1975, the number of persons decertified annually has been relatively stable, averaging about 4.43 percent per year.[66]

Not satisfied with the PRP and security clearances, the Army instituted a further control of human behavior using the two-man rule, which prohibited any lone individual from gaining direct access to nuclear weapons or related information, such as nuclear release messages or unlock codes.

Units had to be prepared for nuclear accidents and incidents. The Defense Department directed a series of OPREP-3 reports, such as Pinnacle NUCFLASH, Pinnacle Broken Arrow, Dull Sword, Empty Quiver and other reports. The Army developed and rehearsed an elaborate program for nuclear accident and incident response and assistance, spelled out in regulations and Field Manual 3-15.

The advent of nuclear weapons caused the Army to become entangled in several new Department of Defense agencies, such as the Defense Nuclear Agency (later Defense Special Weapons Agency) and the Defense Atomic Support Agency. By the early 1960s it had become clear that the employment of these weapons was under the sole authority of the president, and then at the discretion of the unified commander. No longer would Army field commanders have free rein to select the weapons systems they needed to defeat enemy ground forces or meet battlefield emergencies. High levels of authority were involved in tactical decisions to an extent that would have shocked World War II commanders. These defense agencies and their Army equivalents established a strict regimen of unit inspections and certification for units that had nuclear missions,

such as technical proficiency inspections and nuclear surety inspections. The inspections always placed great stress on the units and the entire chain of command.

General Tommy Franks, a Vietnam veteran who commanded the 1st Squadron Howitzer Battery (155-mm), 2d Armored Cavalry Regiment in Germany in 1973-74, later recalled:

> In truth, though, we had concerns more immediate than the threat of an enemy invasion. I spent just as much time worrying about the nuclear weapons inspections to which we were subjected without warning. A cadre of tight-lipped, absolutely-no-bullshit officers from VII Corps, U.S. Army Europe, or the Defense Nuclear Agency would descend on the squadrons, the howitzer batteries, and the storage bunkers. If our state of training, our knowledge of procedures, our record keeping and projectile storage and maintenance did not meet incredibly rigorous standards, we would fail the inspection.
>
> This was the military equivalent of bankruptcy. The Battery commander, the Squadron commander, and perhaps even the colonel commanding the Regiment would be relieved. Our next assignments would probably be as latrine orderlies at a National Guard training camp in northern Wisconsin.[67]

Storage and transportation of nuclear warheads placed special strain on aviation and transportation units, which faced their own requirements for security clearances, personnel reliability and technical proficiency. By the 1970s the movement of weapons by helicopter became routine, certainly overseas. This led to much concern over aviation accidents involving rotary-wing aircraft transporting weapons. Aviation units had to be trained and certified to transport nuclear materials.

Limited Value in Real World Crises

These innovative weapons turned out to have little utility in actual contingency operations, other than perhaps deterrent value. On the other hand, when units deployed without them, they lost those capabilities. Political or strategic considerations in regard to these systems often forced the Army to violate its own doctrine and planning. The

Army learned this as early as July 1958, when U.S. Army Europe deployed elements of the 24th Infantry Division from Germany to Beirut, with their supporting Honest John battery. When the State Department learned that the Army planned to deploy the Honest John, it requested only conventional warheads. U.S. Army Europe objected that the unit should deploy with both types of ammunition. In the end, Battery D, 34th Artillery deployed at least one launcher to Lebanon in July 1958, but it was quickly returned to Germany. One of the junior officers in the battery was Maxwell R. Thurman, who later rose to four-star rank. Meanwhile, the U.S. Marines deployed with their supporting 8-inch howitzers, which were also dual-capable. Army Chief of Staff General Maxwell D. Taylor wrote shortly afterward "In this instance, our political leaders felt that it was against the national interest even to suggest by the presence of the weapon that we might use atomic weapons in Lebanon."[68]

During the Berlin Crisis of 1958-63, U.S. Army Europe had many tactical nuclear weapons available, but it is not clear how Army units may have deployed them or prepared to use them. I have seen no evidence that the U.S. Army deployed dual-capable systems to West Berlin or used them as part of the efforts to keep the land lines open to the city. During the peak of the crisis in 1961, Secretary of Defense Robert S. McNamara decided to deploy 171 Davy Crockett systems to Europe in the fall of 1961 over State Department objections. He felt that "these weapons may be urgently needed by our forces in the event the Berlin crisis comes to a head and that short-run military considerations are overriding."[69]

During the 1962 Cuban Missile Crisis U.S. Army Europe deployed its units to their general defense positions on the inter-zonal border. This may have included

dispersal of nuclear weapons to firing batteries for the various systems: 8-inch howitzer, Honest John, Corporal, Redstone, Lacrosse and ADMs. Within the United States the Army deployed forces to Florida and the Southeast to provide air defense and to prepare forces for the invasion of Cuba. ARADCOM deployed twelve Nike-Hercules batteries to the Southeast. These air defense systems did not include their nuclear warheads, but according to McGeorge Bundy the Army's plans for the invasion of Cuba "probably included the movement of tactical nuclear weapons to Cuba."[70]

During other contingency operations, Army units appear to have deployed without their organic delivery capabilities, into crises such as the Dominican Republic in 1965. When units deployed to Vietnam beginning in 1965, they deployed dual-capable field artillery units (155-mm and 8-inch), but do not appear to have deployed the Davy Crockett or Honest John.[71] During these years Korea remained a dangerous place. During the crisis of 1968-69, U.S. Army units on the peninsula were armed with 8-inch and 155-mm howitzers, Honest John, ADMs and Sergeant, as well as Nike-Hercules air defense systems.

Nuclear VOLAR: The Atomic Army after Vietnam

By the time the Army completed its withdrawal from Southeast Asia, it had been trained and equipped to deliver tactical nuclear fires for two decades, and it continued to maintain those capabilities for two decades more into the era of the All-Volunteer Army (VOLAR). During the years when a non-nuclear Army was fighting in Southeast Asia, an atomic Army was standing watch in Central Europe and the Pacific with at least six nuclear-capable weapon systems. It had custodial detachments in about half a dozen allied countries to support partner armies who were trained and ready to fire U.S. nuclear weapons when authorized by the president. The Army had settled into the

pattern of howitzers and improved missiles. It fielded new systems, usually to existing organizations. Every 155-mm field artillery battery in the Army was potentially dual-capable.[72]

Debates continued about how the Army would fight on a nuclear battlefield and deliver nuclear fires. By the 1960s, the Soviet Army had achieved the capability to deliver nuclear fires, so it would no longer be a one-sided fight. Furthermore, Army leaders realized that authorization to use nuclear weapons might take hours or days, making it impossible to base plans upon immediate use of these weapons. In 1967, NATO had adopted the Flexible Response doctrine. In 1971-72, Army Chief of Staff General William Westmoreland directed the deputy chief of staff for operations and the Strategic Studies Institute to study nuclear operations. The Army's first post-Vietnam capstone manual on operations, FM 100-5, *Operations* (1976), included a chapter on tactical nuclear weapons, but it seemed oddly disconnected from the rest of the thinking. After the October 1973 Middle East war, the Army focused instead on improved conventional weapons and tactics, even though Army nuclear delivery units in Europe had been placed on alert. Army leaders began to see that their atomic capabilities had little utility. Army planners and doctrine writers could not adequately explain how the Army could employ tactical nuclear weapons on the battlefield, although they continued to publish doctrinal materials such as Field Manual 100-30 (Test), *Tactical Nuclear Operations* (August 1971). Operational doctrine writers paid little attention. The writers of the 1976 edition of FM 100-5 "virtually ignored the problems of conducting combat operations on the nuclear battlefield" and included only a short

chapter on tactical nuclear operations drafted by staff officers in Headquarters, US Army Europe. Writing in the mid-1980s, one Army author concluded:

> Perhaps the most important regularity in the Army's policy-making for the nuclear battlefield is the continued recognition by military authorities that Army units could not pass the test of two-sided nuclear operations. Every major analysis of the Army's force design and doctrine has reaffirmed this conclusion, yet the weapons and the rhetoric remain.[73]

But the Army of the 1970s was not the Army of the 1950s and 1960s. By the end of the Vietnam War, nuclear delivery units in Central Europe and elsewhere suffered from all the problems of the rest of the Army, from indiscipline and drug abuse to racial tensions. The shift to an All-Volunteer Army initially came with a drop in quality of recruits and a rise in indicators of indiscipline. In 1973, the Joint Committee on Atomic Energy found that during a recent one-year period, "more than 213 army enlisted men on 'nuclear weapons duty' had been removed from the program for drug abuse."[74]

Field Artillery officers and noncommissioned officers who had served in Vietnam often went on to serve in nuclear-capable artillery units during a time of great stress for the Army. Now these officers and noncommissioned offices had perhaps twice as many nuclear-capable units to lead than the Army had had before the Vietnam War. In 1973, when Capt. Tommy Franks took command of the Howitzer Battery, 1st Squadron, 2d Armored Cavalry Regiment, in Bayreuth, Germany, the unit was filled with "an inordinately high number of troops who did not want to be in the Army," including several drug dealers whom he identified and got rid of. "Morale wasn't good, and near-mutinous ill-discipline was rife in some units."[75]

The poor overall quality of soldiers was counterbalanced by the opening of numerous career fields to women. For the first time a significant number of women were assigned to units with nuclear responsibilities. Women were not allowed to serve in air

defense or field artillery units during this time, but served in military police and maintenance duties associated with weapons. In December 1977, the Secretary of the Army announced a new policy:

> The changes now permitted enlisted women to serve as crew members at long-range missile and rocket sites (Pershing, HAWK, Hercules), . . . Field Artillery Surveyor (MOS 82C), and in nuclear security duties not involving recovery. Women officers could be assigned to specialties that involved long-range missiles and rockets and any aviation position except attack helicopter pilot.[76]

By the early 1970s nuclear weapons storage locations had another concern: left-wing terrorist and anti-nuclear groups. In 1971, unknown persons broke into a training room of an 8-inch howitzer battery on a U.S. Army base in Hanau and tampered with 8-inch projectile training simulators.[77] The Irish Republican Army waged a campaign of terror in Northern Ireland and Great Britain and threatened acts of terror against British forces on the continent. The real wake-up call for U.S. nuclear locations and units in Europe was the attack on the summer Olympics in Munich in September 1972, when an eight-man commando squad from the Palestinian Black September group kidnapped the Israeli Olympic team. This stoked concerns over physical security of nuclear weapons storage sites in Europe and the Defense Department began a Long-Range Security Program in 1975 in the United States and overseas, with intrusion detection systems, improved facilities for guard forces and improved lighting and communications. In 1981, Italian Red Brigades kidnapped an American brigadier general in northern Italy, while in Germany the Red Army Faction attacked the commander-in-chief of U.S. Army Europe with a rocket-propelled grenade in Heidelberg.

Some Army leaders continued to believe in the utility of battlefield nuclear weapons in line with the first Army advocates in the 1950s. Shortly after General James

H. Polk retired in 1971, he published an article bemoaning the presumption that tactical nuclear weapons will lead inevitably to “Armageddon and total disaster.” In the 1950s and 1960s he had served in several key assignments in Europe, including command of V Corps and U.S. Army Europe. He held firm to the warfighting potential of tactical nuclear weapons and described tactical scenarios that should not provoke a large Soviet reply. “[W]e need to get over the ‘fire break’ mentality and initiate a vigorous program to modernize our Europe-based stockpile. . . .”[78] A Brookings Institution report on the nation’s atomic arsenal after the Cold War reminded readers that: “The army remained heavily nuclearized through the 1980s. In 1984 it possessed more than 5,000 nuclear warheads, in addition to 300 nuclear-capable SSMs of various ranges, 200 nuclear-capable SAMs, 610 ADMs, and more than 4,300 nuclear-capable artillery pieces.”[79]

Nevertheless within Army senior leadership contrary voices made themselves heard. The Army had quietly retired some systems from the inventory, including the Davey Crockett and Little John. Others were upgraded or replaced by more capable systems. Honest John rocket battalions were eliminated as divisional units after the 1970 division reorganization, while new Lance missiles, which became operational in 1973, took their place at corps level. Stationing options were changing as well. When the U.S. government transferred control of the Ryukyus back to Japan in 1972, the United States quietly removed all nuclear weapons from Okinawa, some of which may have been there since the mid-1950s. Contingency operations in the 1980s showed no use for tactical nuclear weapons: the invasion of Grenada in 1983, the simmering counterinsurgency in Central America, and the 1989 invasion of Panama.

Doubts were even raised about their utility in Central Europe. In December 1978, the commander of the U.S. Army Training and Doctrine Command, General Donn A. Starry, wrote the Army deputy chief of staff for operations about the Army's "ability to release and deliver tacnukes": "The totality of my own experience in Europe with release procedures, commo procedures attendant thereupon, a host of other considerations, and considerable analysis of the battle leads me to conclude that there's no reasonable way for us to count on nuclear weapons in the first-echelon fight." He continued: ". . . if you believe anything like the line of reasoning set forth above, we have a whole lot of the wrong kind of weapons in our stockpile. We can't deliver them in time, we can't deliver them on the most critical targets, we haven't enough to deliver them from the delivery means that can reach the critical targets, and so on." He concluded: "we've probably got it pretty well wrong with regard to our doctrine for employment of tacnukes, the weapons themselves, and their delivery systems."[80]

However, in the mid-1970s the Soviet Union deployed a new generation of intermediate-range ballistic missiles in Eastern Europe. NATO responded by deploying U.S. Air Force ground-launched cruise missiles and U.S. Army Pershing II ballistic missiles. The U.S. Army began to convert its Pershing Ia units to Pershing II. The first unit became operational in December 1983 and a total of 108 missiles were deployed. The range jumped from 460 miles to 1,200 miles with much greater accuracy. The Army awarded the 56th Field Artillery Brigade the Army Superior Unit Award for the period of initial deployment from November 1983 to December 1985.[81]

Nevertheless, there were harbingers of change. Public opposition to nuclear weapons reached a crescendo in the early 1980s as nuclear weapons storage sites in

Europe faced mass demonstrations, sparked especially by the deployment of Pershing II and cruise missiles. In southern Germany, anti-nuclear demonstrations focused on the Mutlangen storage area near Schwäbisch Gmünd beginning in 1983. Inside the gates, operating the complex systems remained a challenge. On January 11, 1985, a missile stage exploded at Camp Redleg near Heilbronn, killing three soldiers from C Battery, 3rd Battalion, 84th Field Artillery.

Other voices continued to be raised within the Department of Defense to challenge the battlefield nuclear requirements. The mission of continental air defense had ended and the dual-capable Nike-Hercules system had been retired in 1979. None of the "Big Five" Army acquisition programs involved upgrading the Army's nuclear delivery capabilities, not even the Patriot air defense missile, which replaced the dual-capable Nike-Hercules. The Army quietly withdraw ADMs from Europe in the 1980s. The Army sought to develop a follow-on to the Lance system, but was frustrated. The dual-capable 8-inch howitzer was slated to be replaced by the conventional multiple-launch rocket system. In December 1987, President Reagan signed a treaty with the Soviet Union, to remove all intermediate-range weapons from Europe. The Army removed and dismantled the Pershing II missiles almost as rapidly as they had been deployed. The 56th Field Artillery Command was inactivated on June 30, 1991.[82]

Nevertheless, battlefield nuclear weapons remained part of defense planning in Central Europe and Korea. When Lt. Gen. Colin L. Powell took command of V Corps in Germany in 1986, his G-3 briefed him on the plan to use the corps' nuclear weapons:

> We were not talking simply about dropping a few artillery shells at a crossroad. No matter how small these nuclear payloads were, we would be crossing a threshold. Using nukes at this point would mark one of the most significant political and military decisions since Hiroshima. The

> Russians would certainly retaliate, maybe escalate. At that moment, the world's heart was going to skip a beat. From that day on, I began rethinking the practicality of these small nuclear weapons.[83]

In 1990, Army Chief of Staff General Carl E. Vuono, himself a former artilleryman, laid out a vision of the future Army as a purely conventional force.[84] In October 1990, Secretary of Defense Dick Cheney asked Powell, by then Chairman of the Joint Chiefs of Staff, to look at options for using tactical nuclear weapons against the Iraqi army. When the Joint Staff came back with some nuclear strike options, "The results unnerved me. To do serious damage to just one armored division dispersed in the desert would require a considerable number of small tactical nuclear weapons. . . . If I had any doubts before about the practicality of nukes on the field of battle, this report clinched them."[85] The U.S. Army deployed a mix of heavy and light forces for Operation Desert Shield and Operation Desert Storm, including their dual-capable 155-mm and 8-inch battalions, but not with nuclear warheads. After Desert Storm, the Army continued with its plan to retire the venerable dual-capable 8-inch howitzer.

Standing Down

In the early 1970s, by direction of the president the Army had dismantled its chemical weapons capability and safely retrograded all chemical stocks from overseas locations. In fall 1991, history repeated itself. As the Soviet Union collapsed, President George H.W. Bush announced a Presidential Nuclear Initiative. The Army withdrew its warheads from overseas and domestic locations in a matter of months. The intense routine of training and technical inspections that had set the rhythm of unit activities for four decades came to a sudden halt. The 59th Ordnance Brigade safely removed the weapons under its control from Europe by mid-1992. The U.S. Army Europe PAL detachment was inactivated in June 1992. Other weapons were removed from Korea.

Warrant officers and noncommissioned officers with nuclear weapons specialties were transitioned into other fields.[86]

Experienced warrant officers were key to the process. For example, Chief Warrant Office 5 Cecil E. Hutson, who had attended the Army Nuclear Weapons Assembly Course, in Albuquerque, New Mexico, in 1962, was inducted into the Ordnance Corps Hall of Fame for his contributions, in the words of his award citation:

> He was assigned duties at AMCCOM [U.S. Army Armament, Munitions and Chemical Command] in October 1991 that put him directly responsible for the retrograde and demil of items returning from overseas. He was the Army's last nuclear weapons technician to be directly involved with the removal of weapons from overseas. He performed this function without error. He published and provided instructions, which assisted the nuclear weapons draw down at the installation level (e.g., nuclear PRP, termination guidance, rescinding the depot's mission capability statement, and achieving instructions for nuclear mission records). He has proved to be the Army's expert on Nuclear Weapons.[87]

Brig. Gen. John Sloan Brown, former chief of military history, summed up the change: “In 1989 the Army had 141 nuclear weapons-certified units. In 1992 it had none. Nuclear weapons had been redefined as strategic, and the Army had been redefined as non-nuclear.”[88]

The Army doctrine for nuclear operations published in 1996 marked the end to the Army’s role to deliver nuclear fires:

> Before 1991, the US Army had custody of tactical nuclear weapons which were to be employed, on Presidential release, by organic Army field artillery units. In September 1991, the Presidential Nuclear Initiative (PNI) removed the organic nuclear responsibility from the US Army. Today the Army neither has custody of nuclear weapons nor do corps and divisions employ them. The US Air Force or the US Navy are now responsible for delivery of nuclear weapons in support of Army operations. The Army retains its role in nominating nuclear targets and is also responsible for nuclear force protection.[89]

Conclusions

The measured tone of the Army's post-Cold War doctrine begs the question, if the Air Force and Navy can deliver nuclear weapons in support of Army operations, why did the Army maintain its own independent capability for so long? Former Army Chief of Staff General Maxwell D. Taylor offers a possible answer. In his memoir he expressed regret that the Army in the 1950s had been drawn "into a costly and losing competition with the Air Force in producing an Intermediate Range Ballistic Missile (IRBM) at a time when the ammunition reserves for basic Army weapons were far too low for comfort. . . ." Nevertheless, he wrote, "nuclear weapons were the going thing and, by including some in the division armament, the Army staked out its claim to a share in the nuclear arsenal."[90] This could serve as the epitaph for the Atomic Army: it transformed itself into a nuclear-capable landpower, not for any plausible tactical or operational requirement, but because that was the "going thing."

Assessing the costs to the Army for having maintained itself as a dual-capable force over four decades would be difficult. For the Field Artillery and Air Defense Artillery branches, in particular, the costs in personnel and training time were high. Enormous resources were expended on nuclear surety, redundant communications systems and never-ending inspections. The risks of accidental or deliberate nuclear detonation or contamination, both on and off the battlefield, were very high indeed. The burden of maintaining nuclear readiness contributed to the "zero-defects" mentality that spread throughout the Army in the 1960s.

The Army's experience as a nuclear landpower highlights several positive traits. It demonstrated a remarkable ability to innovate, adapt and maintain readiness with unprecedented new weapons, despite strategic and doctrinal uncertainty. Soldiers and

leaders were at the heart of this capability; draftees and volunteers alike operated systems more sophisticated than soldiers had ever operated before in austere environments and under field conditions, including advanced electronics, radar, communications, hazardous fuels, computers and missile technology. They maintained peacetime readiness in a “zero-defects” environment, continually subjected to tests and inspections. The Army National Guard shared responsibility with the Active Army for air defense of the homeland with nuclear-tipped missiles. Soldiers stood on alert with intermediate-range ballistic missiles under the operational control of the Supreme Allied Commander Europe. Soldiers trained allied armies with similar capabilities and maintained custody over assigned warheads on foreign soil.

Nevertheless, on balance the Army devoted enormous time, resources and energy to maintain a capability that lacked adequate justification, simply because it was the “going thing.” By the time the Soviet Army had developed matching battlefield capabilities and the United States had made nuclear security guarantees to its allies, the Army was locked into maintaining an expensive, dangerous capability that had little practical utility, drained precious resources, hampered conventional capabilities and incurred potentially catastrophic risks. Not until the end of the Cold War and a bold presidential initiative could the Army reverse course and end its four decades as an “atomic army.” The Army of the future must continue to innovate, but innovation must serve a valid purpose.

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