IRREVERSIBLE NUCLEAR DISARMAMENT

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Disarmament and Reversibility: A Case Study of the Denuclearisation of the United States Army

Dr James Tegnelia

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Dr James Tegnelia

Dr Tegnelia retired as Executive Vice President and Deputy Director of Sandia National Laboratories in 2010. From 2010 to 2018 he was a member of the Department of State International Security Advisory Board and a Research Professor at the University of New Mexico. From 2005 to 2009 Dr Tegnelia was the Director of the Department of Defense Threat Reduction Agency (DTRA) and regularly testified before both chambers of the United States Congress on US efforts to combat weapons of mass destruction. From 1976 to 1985, he was a member of the Defense Advanced Research Projects Agency (DARPA) where he served as Deputy Director and Acting Director. Dr Tegnelia was a member of the US Army 1964 to 1970 rising to the rank of Captain and a veteran of the Viet Nam war. He has a PhD in Physics with a minor in Chemistry from The Catholic University of America. He previously served as Chair of the Army Science Board advising the Secretary of the Army and he is currently a member of the Defense Science Board advising the Secretary of Defense and consults for both Sandia National Laboratories and the Lawrence Livermore National Laboratory.

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Cover photo: Soldiers with the 4th Infantry Division drill with an Honest John nuclear rocket (undated)

Introduction

Arms control is recognized to encompass three elements: 1) verifiability: The effectiveness of an Inspection regime; 2) reversibility: The ability to undo arms control commitments, and 3) transparency: The ability to discover changes to arms control commitments. This paper explores the second of these by addressing reversibility through the history of one class of nuclear weapons: the US Army's battlefield nuclear weapons and the potential for reversing US and allied decisions to withdraw these from Europe during and just after the Cold War. These weapons were fielded as a deterrent to tactical warfare beginning in 1953 when the US had a monopoly with this technology.

While the above three considerations are central to arms control deliberations, other elements also play important roles in arms control decisions. This paper focusses on military worth or effectiveness, the contribution that the nuclear weapons under consideration contribute to deterrence and if, deterrence fails, contribute to waging war. Military effectiveness is therefore an important element of this paper. The paper asks if US and Western Cold War assessments of the effectiveness of battlefield nuclear weapons and the current status concerning these weapons is evidence for the difficulty of reversibility. The paper explores the hypothesis that under current circumstances, Western forces would find it difficult to reverse a decision to denuclearize its military land forces. The difficulties would arise from commitments made to and by allies as well as potential adversaries particularly at the end of the Cold War.

Battlefield nuclear weapons are generally divided into five subsets. The first is comprised of short-range rocket and missile systems. Beginning in 1953, this subset was the first deployed of this general class of nuclear weapons. Important members of this subset are the Honest John and nuclear Lance. European nations also deployed weapons in this subset as did the Soviet Union. The second subset comprise short-range recoilless rifle systems. The most important weapon of this subset was the Davie Crockett. The third subset is comprised of artillery fired weapons, the smallest being the W48 155mm projectile and the largest the M65 288mm artillery cannon and nuclear round. The fourth subset comprises demolition munitions and land mines, hand emplaced to destroy land targets such as bridges. The most important member of this subset is the Special Atomic Demolition Munition or SADM, designed to be used against logistics facilities and bridges. Smaller demolition weapons were also produced. The most important was the MADM or Medium Atomic Demolition Munition, employed primarily as a hand emplaced land mine. The last class of these weapons comprises air delivered weapons. The Air Force has the ability to deliver air dropped nuclear munitions on a tactical battlefield, the primary weapon being the B61. Approximately 20 individual weapon systems comprise these five battlefield nuclear weapons subsets. Tens of thousands of these systems were produced making them the largest class of nuclear weapons produced and deployed. These weapons

systems are not and were not the subject of arms control treaties but rather were the subject of both West and East initiatives to deploy and then withdraw them. Considering these subclasses of nuclear weapons will allow a reasonably complete assessment of one application of nuclear weapons technology that historically has been employed as a warfare deterrent and then withdrawn.

Those applications not investigated here include strategic nuclear weapons, intermediate range nuclear weapons and Navy short range nuclear weapons including nuclear torpedoes and depth charges. Similarly, this paper will not address nuclear warhead air defense weapons, examples of which include the Nike family. The history of this class is similar to the case study of this paper. Technology advancement, for example the Strategic Defense Initiative and follow-ons, made the need for nuclear warhead air defense obsolete and today there is no Western call for reversal.

The Approach

The paper reviews the history of this application beginning after World War II in order to assess the ease or difficulty today of reversing the decisions made during and immediately after the Cold War to withdraw these nuclear weapons from Europe. The US Department of Defense spent significant time and effort encompassing both field investigations and analysis to assess how effective battlefield nuclear weapons would be as a tactical nuclear deterrent. Simultaneously, it explored actions taken by the US Army and Air Force and the US Defense Advanced Projects Agency (DARPA), to determine the potential of advancing technology to produce an effective non-nuclear or “conventional” deterrent. The department assessed through field testing and analysis whether this technology could provide a conventional deterrent of equal or superior capability to nuclear systems.

While the US initiated this nuclear approach to battlefield deterrence, in order to assure allied acceptance of weapons potentially to be used on alliance terrain, the US engaged in an allied consultation and decision process. The paper therefore explores whether US allies supported US decisions on conventional versus nuclear deterrence.

Finally, the paper looks at the Soviet Union’s approach to battlefield nuclear weapons, how this affected US and alliance actions and how Moscow reacted to NATO actions. The intent is to give visibility into the conditions necessary for a hypothetical reversal of guidance by looking back at all of the elements of this decision to reduce or eliminate dependence on nuclear weapons to satisfy this battlefield deterrence requirement.

The Cold War History of the US and NATO with Nuclear Warfighting Capability

During the early 1950's, General Dwight Eisenhower made the decision to reduce the number of active divisions in the US Army by two thirds, from 96 divisions to 26 divisions immediately after he was elected US president. These divisions were a legacy of World War II and the Korean War. Eisenhower desired to redirect federal funds from defense to civilian purposes, which were sacrificed during the two wars. The USSR, in contrast, did not demobilize to address civil needs after World War II, an important decision in the Soviet pursuit of the Cold War. The remaining one third of US divisions would be equipped with nuclear weapons as part of Eisenhower's "New Look" defense establishment. The belief was that reduction of the number of divisions alongside the nuclearization of the remaining divisions would provide adequate deterrence against the large number of Soviet Union forces stationed in Europe. General Omar Bradley, during this period Chief of Staff of the US Army succeeding Eisenhower and then first Chairman of the US Joint Chiefs of Staff, believed that battlefield nuclear weapons were the ultimate battlefield weapon and that nuclearization of US Army divisions is what made this deep demobilization possible without risking US national and Western security. The mission of these forces would remain unchanged, that of "closing with and destroying opposing armed forces." This mission was clearly different from the US Air Force-led nuclear strategic mission.

While NATO nations were consulted, basing US nuclear forces in Europe was considered essential to gain US deterrence against Soviet Union military action. While concurrence was granted, European nations expressed reservations about use of nuclear weapons on their territory. As a result, as we shall explore, release authority was always at issue in NATO deliberations and never adequately resolved. Throughout the Cold War, and in particular in preparation for President George H. W. Bush's Presidential Nuclear Initiatives (PNI) at the end of the Cold War, NATO summits emphasized reduced dependence on battlefield nuclear weapons for the defense of Europe and the desirability of removing battlefield nuclear weapons from the continent.

During the 1950's, the US was the only world power that could field battlefield nuclear weapons. The Honest John, made operational in 1953, established this deterrent. However, this monopoly lasted less than a decade. The Russians surprised the West by testing a nuclear device in 1949 and testing a V-2 missile-based nuclear weapon system, beginning in 1956. The first Russian battlefield nuclear missiles were fielded in 1960, the FROG or LUNA, and in 1961, the SCUD. The doctrine the US Army established at the time the Russians began to deploy nuclear weapons was comprised of two parts:

1. Targeting means and release authority in a timely manner to assure engagement and destruction of relevant targets.

2. Intelligence and tactics for maneuver on a nuclear battlefield to assure survivability of friendly forces.

The US Army during the 1960's through the 1980's, beginning at the behest of US Secretary of Defense Robert McNamara, explored the policy and operational implications, of employing battlefield nuclear weapons. Field testing and analysis explored doctrine, organization, tactics, and the battlefield effectiveness obtained from this new approach to battlefield deterrence. It was compared to modern (for its time) conventional forces and their military effectiveness.

During the 1950's and 1960's the Army tested the post-World War II division organization structure, named the Pentomic Division, to measure its capabilities against the above doctrine. These tests allowed assessment of the nuclear division to perform the ground combat mission. The results were not encouraging. The time for nuclear release was too long to be effective and the ability to disperse and mass was too long to assure survival on a nuclear battlefield.

This situation was made more complex by President John F. Kennedy, again, initiated by Secretary McNamara. Rather than emphasizing nuclear equipped units, President Kennedy instituted the Flexible Response doctrine. This doctrine instituted the ability to fight with nuclear or non-nuclear weapons, a doctrine unable to be performed effectively by the Pentomic Division. In order to implement Flexible Response and coupled with the poor performance of the Pentomic Division against this doctrine, the Army created new "Reorganized Division" structures. Of primary importance was the ROAD or Reorganized Armor Division. This division was believed key to Cold War deterrence during this period as the Armor unit was thought able to deter and fight Soviet divisions in conventional war and with its mobile capability best able to mass and disperse in the event of a presumed two-sided (both sides employing nuclear weapons) nuclear escalation. Both the Pentomic and new organizations were assessed in a series of analytic trials known as "Oregon Trails" and field trials the most revealing of which was called "Sagebrush." As with the Pentomic Division, the ROAD was unable to effectively meet nuclear doctrinal requirements. Both division organization structures, the Pentomic and ROAD, were unable to meet NATO established release constraints and survive on a nuclear battlefield.

The results did not make a strong argument for the effectiveness of the nuclear approach to battlefield warfare to either the US Department of Defense, the US Congress, or the NATO alliance. The US Army under the direction of General William DePuy looked at a third organizational approach called the Division Reorganization Structure (DRS). This structure was driven not by nuclear warfare but by lessons learned from the 1973 Arab-Israeli War. This structure was found more able to address conventional war of the kind observed in the Middle East but as with the previous two post-World War II division structures was not able to meet nuclear doctrinal requirements.

President Richard Nixon and his Secretary of Defense James Schlesinger were aware of the negative results of the above tests and analysis. They were also aware of the reservations of NATO partners to rely on nuclear operations on their terrain should non-nuclear deterrence fail. President Nixon and Secretary Schlesinger directed the US Services and the US Defense Advanced Research Projects Agency (DARPA) to invest in technology that would significantly increase conventional force effectiveness and thereby reduce dependency on battlefield nuclear weapons. This effort led to stealth aircraft, a new generation of ground target sensors which for example led to the JSTARS radar aircraft, advanced Command and Control and the foundations of precision shaped charge warheads applied for example on the current Javelin and Hellfire missiles. These warheads allowed small conventional missiles to defeat the most powerful Soviet armor. The US Services also fielded new traditional equipment such as the M1 Abrams Tank and the F-16 Fighting Falcon.

Analysis that compared new conventional systems equipped divisions with nuclear weapons equipped units lead to the conclusion that the division equipped with new non-nuclear capability was as effective as the nuclear one. This analysis, led by Dr. Donald Cotter and Dr. Joseph Braddock for US Senator Sam Nunn, conducted in the early 1980's, provided political and doctrinal support for the deemphasis of battlefield nuclear warfare. The Army work resulting from the 1973 War, and Senator Nunn's efforts also led to the Follow-on-Forces doctrine of General Bernard Rogers, then NATO's Supreme Allied Commander.

The above was a second example of evidence that the US with NATO concurrence was deemphasizing nuclear deterrence when compared to conventional weapon wartime effectiveness. Procurement of non-nuclear hardware was emphasized at the expense of nuclear weapons such as the Davey Crockett, nuclear artillery, and missiles such as the Honest John. The Lance battlefield nuclear missile, the last of the surface-to-surface battlefield nuclear missiles, was withdrawn in 1992 as part of President Bush's Presidential Nuclear Initiatives and replaced by the conventional ATACMS missile. The ATACMS missile employed force structure was made available by withdrawal of the eight-inch nuclear artillery. The US Airland Battle doctrine of 1978 provided nuclear capability as a deterrent through tactical air allowing the elimination of battlefield nuclear weapons in the ground force.

As previously mentioned, the Soviet Union also deployed tactical nuclear weapons for application on a European battlefield. The Russian technology suffered limitations relative to Western developments. First, their targeting and Command and Control means were not as timely or accurate as those of the West. As a result, their warheads and delivery systems were larger than those of the US and therefore represented a major threat to the West but also lucrative targets for exploitation by the West. An example was the USSR FROG (Free Rocket over Ground) which with its support equipment was an important target for Western non-nuclear systems. Marshal Nikolai

Ogarkov, Commander of Warsaw Pact forces and later the Chief of the Russian General Staff, the highest-ranking military officer in the Soviet military, recognized this and saw the Western conventional force as the Warsaw Pact's critical threat not its nuclear capability. His words and actions on nuclear and conventional forces were not a sign of an effective Western nuclear deterrent and he was eventually fired over differences in technology policy represented here. The FROG was replaced by the SS-21 Scarab with improved range and accuracy to reduce these USSR Cold War limitations.

Arms control and disarmament of battlefield nuclear weapons was not the subject of treaties. Actions by both the West and East concerning these weapons were self-initiated both in deployment and withdrawal. Throughout the Cold War, and in particular in preparation for President George H. W. Bush's Presidential Nuclear Initiatives at the end of the Cold War, NATO summits emphasized the advisability of removing large numbers of nuclear weapons from Europe. As the Cold War wound down and the threat of war in Europe diminished, the Bush initiatives caused the complete withdrawal of US battlefield nuclear weapons. The Soviet Union, as evidenced by Gorbachev's actions, agreed with this assessment. The US Nunn-Lugar Cooperative Threat Reduction initiative after the Cold War helped Russia withdraw nuclear weapons from East Europe and secure them in Russia. During the latter years of the Cold War, allied preparation for battlefield nuclear warfare, therefore, was limited to effective defensive operations and Dual-Capable Aircraft (DCA).

What remains to be explored is the situation today and an evaluation of the possibility of reversing these decisions in favor of rethinking a nuclear battlefield deterrent.

Current Capabilities and Perceptions.

Today presents several significant differences over the end of the Cold War. First the NATO of today is significantly different from that of the Cold War. However, there is no call today to save funds for civilian renewal by reversing the emphasis on conventional deterrence in favor of battlefield nuclear weapons.

More difficult to assess is the potential entry of China into today's arms control agreements. Thus, the "resilience" of these arms control decisions in this new three-party world is an important consideration. However, the resilience of the entire regime, conventional and nuclear, would be improved if the US and its alliance partners did not reverse their positions on the obsolescence of battlefield nuclear weapons but rather applied conventional means as an important tool for deterrence of major conflict. The problems of resilience are another argument to support past US Secretary of Defense Ash Carter's position that non-nuclear technology should be employed to limit nuclear arms requirements to the important strategic "background" position of helping to assure international security stability.

The situation today regarding battlefield nuclear weapons has not changed markedly from the end of the Cold War. The current US Army Division (the DRS Division described above) has significantly more systems than the Pentomic Division that could be converted from conventional or non-nuclear use to dual nuclear and conventional capable use. The Pentomic Division had 20 dual-capable systems and today the DRS division has approximately 120 systems that are conventional only but could be converted to dual-capable systems. They include smart artillery, and precision surface-to-surface missile launchers. Modernization of these systems includes range extension and accuracy enhancement to account for the longer distances required in the Pacific theater. The increasing accuracy of precision munitions increases the effectiveness of such weapons. Modern targeting capability, including space systems and unmanned air and ground systems carrying visible-IR cameras and radars, is significantly improved over Cold War capability. These systems provide significant increases in targeting quantity, quality, timeliness, and accuracy. Space based, unmanned air vehicles and ground-based sensors have significantly increased the division's targeting means and are described as making the battlefield "transparent". Modern digital command and control systems are significantly improved over the systems used in the "Oregon Trails" and "Sagebrush" tests. The command and control system can distribute targeting data in larger quantities and at faster speeds over that available during the Cold War. While hard to show from the wars in Ukraine and Gaza, the technology which served as the foundation of the Cold War conventional deterrent has increased in effectiveness over time over nuclear systems reducing levels of potential damage and military and civilian loss of life. This makes battlefield nuclear weapons obsolete over the non-nuclear weapons currently deployed employing this technology. Continued growth of this conventional capability is expected as artificial intelligence technology is applied. This technology makes reversibility less probable.

A topic that should be addressed is whether this new technology could make significant improvements in nuclear systems affecting reversibility. The previous section reviewed the inability of nuclear systems to meet established doctrine during the Cold War. Regarding the Cold War doctrinal deficiencies, the issue of release deserves special attention. "Oregon Trails" established that the targeting and command and control of the time contributed to unacceptably long release times. The question arises concerning whether the greatly improved targeting and command and control developed for today's non-nuclear operations would change the assessment of the effectiveness and utility of battlefield nuclear weapons. The answer appears in the negative. The "Oregon Trails" final report concluded that securing Presidential, North Atlantic Council and NATO Command approval "has been shown to be so slow that timely decisions are impossible." New technology would not markedly affect these delays in the human decision cycle.

In order to provide other options, "Oregon Trails" explored a "TIOP" or a tactical analog of the Strategic Integrated Operating Plan or SIOP. The approach was to allow pre-

approval of packages of weapons and strikes as is done with the SIOP thus speeding release. However, battlefield operations are so fluid and unpredictable compared to strategic that pre-release of weapons for tactical use was found to be unworkable given Western doctrine. “Oregon Trails” summarized the tactical release problem as follows: “Reliable processes for politically controlled and military responsive release would be as difficult to devise as they were urgently needed.” That situation has not changed since the mid 1960’s. The Soviet Union solved this problem by pre-assigning a fixed number of nuclear weapons to the Front Commander to be used at his discretion. Such a tactic was unacceptable to NATO. As long as political approval determines total operational release times, modern targeting and command and control would not result in meeting today’s doctrinal requirements.

The effort of potential US adversaries to develop their own conventional capabilities mirroring those available to the West is evidence of the obsolescence of Western offensive battlefield nuclear weapons. China specifically is attempting to develop its own approach to non-nuclear “rocket forces” employing missiles that mirror Western precision missiles to hold at risk targets important to the Pacific theatre. The only threat of use of battlefield nuclear weapons is made by those unable to field such a conventional capability and concerned that without nuclear weapons they will be unable to sustain operations in a battlefield employing modern non-nuclear weapons.

Thus, potential Russian use of battlefield nuclear weapons acknowledges the superiority of Western forces in conventional warfare. The requirement to respond with tactical battlefield nuclear weapons in order to deter or defeat Western forces equipped with superior non-nuclear technology is admission of a fear of inferiority on a modern conventional only battlefield. Ukraine experience confirms this perception. Comments made by Marshal Valery Gerasimov, the current Chief of the Russian General Staff, mirroring those of Marshal Nikolai Ogarkov made during the Cold War, have acknowledged as much employing doctrine establishing the need for nuclear battlefield weapons to reduce this inferiority. This doctrine is given the descriptor “escalate to deescalate” under the assumption that escalation by Russian forces employing nuclear weapons can deter or defeat Western forces equipped with modern non-nuclear capability only, thus de-escalating combat. That proposition assumes that Western forces will not respond with nuclear weapons but rather rely on future application of non-nuclear capability as a defense against Russian tactical nuclear weapons use. Being able to avoid the risks of escalation with such a strategy is an advantage of Western technology.

As a result of Western belief in the obsolescence of battlefield nuclear weapons and this Russian doctrine, US Army battlefield nuclear policy is limited to one sided defensive operations only (defense of US forces against an enemy employing battlefield nuclear weapons). Changes to such top-level guidance to support US nuclear offensive warfighting capability, or two-sided operations, would require US Army, DoD, and Presidential approval. Such a change would not be considered without

alliance deliberation and agreement. Given the assessment of modern non-nuclear battlefield weapons, there is no indication of support for such a change.

Conclusion

What conclusions considering reversibility can we draw from this history? Nuclear weapon technology is generally credited with deterring major war between major powers. US casualties have been declining from World War II to Korea to Viet Nam to finally the Iraq and Afghanistan conflicts. Why do these benefits accrue to the strategic nuclear deterrent and not battlefield nuclear deterrence? In order to create such a viable battlefield deterrent, the history of battlefield nuclear weapons testifies to meeting three tests.

1. Requirement: if nuclear technology with its ability to create significant damage and death, is to be applied to satisfy a national or international need, is the requirement critical to national and international security?
2. Technology: Does the technical approach to creating a hypothetical deterrent, under test and analysis, satisfy the need? Are there viable comparable alternatives?
3. National and international security: Is there national and international agreement on the need and effectiveness?

Immediately after World War II when the US had a monopoly with nuclear technology, the requirement was considered obvious and important. Nuclear battlefield weapons were thought to be a deterrent that allowed saving precious resources to help rebuild Europe after World War II. However, when this monopoly was lost, nuclear war in Europe became more probable risking destruction of all of the World War II recovery effort. Both the US and allies in Europe recognized this.

Did the nuclear deterrent satisfy this requirement after the Western monopoly ended? The US Army attempted but was not able to field a nuclear equipped land force to perform as an effective warfighting capability, the basis for deterrence. Specifically, the force equipped with targeting and command and control of that time was unable to meet the release criteria consistent with a practice acceptable to the US and NATO on a European battlefield. This topic was covered more thoroughly in paragraphs three and four above. This conclusion was derived based on extensive analysis and field trials conducted in the US and Europe. Further, its warfare effectiveness tested repeatedly did not fare well relative to the effectiveness of non-nuclear approaches. Such nuclear organizations would come at the expense of non-nuclear warfighting capability and non-nuclear deterrence, the emphasis of the alliance.

The battlefield nuclear deterrent was assessed by both the US Defense Department and alliance partners employing programs like “Sagebrush” and “Oregon Trails.” Conventional forces were more effective with less loss of life and property. Further,

military operations involving nuclear weapons were perceived by the military under test and exercise to be significantly more difficult given doctrinal constraints. Deployment, employment, and support were found in extensive field tests to be significantly more complex and rigid than operations with non-nuclear forces.

Throughout the Cold War, and in particular in preparation for President George H. W. Bush's Presidential Nuclear Initiatives, NATO summits emphasized the advisability of removing land based nuclear weapons from Europe. The summits favored non-nuclear defense over nuclear on a European battlefield. The Soviet Union, as evidenced by Gorbachev's actions, agreed with this assessment. During the latter Cold War, allied preparation for battlefield nuclear warfare, therefore, was limited to effective defensive operations.

Hopefully the historical approach taken throughout this article helps attest to the fact that battlefield nuclear weapons were unable to pass any of these above three tests after the USSR was able to create its own nuclear battlefield without the constraints of Western doctrine of detailed above. When the US military could not pass these three tests with its battlefield nuclear weapons, General Bradley's predictions could not be fulfilled.

In conclusion, one finding that should be emphasized is the consistency of US and Western policy beginning in the 1960's after the findings of "Sagebrush" and "Oregon Trails" regarding the application of nuclear weapons to the tactical battlefield. Under security conditions that existed then as today, battlefield nuclear weapons have been proven to be obsolete when compared to non-nuclear means, hardly a basis for decision reversal. There is no evidence that either European or Pacific alliance partners convictions or US policy should or would change concerning such nuclear offensive operations. Such a test and analysis process, begun in the 1960's, should be expected in the future. This process would give confidence that reversal could be expected only if the world situation were to significantly change, and nuclear weapons deployment reversal could be proven to assist in improving US national and Western security. While the reversal of arms control decisions is possible, such a reversal must be proven to be consistent with military effectiveness. Today there is no evidence to support such a reversal.

Sources

The arguments presented here were taken from James Tegnelia (2018). *The Essential Alliance*. Arlington Virginia, The Potomac Foundation. Because of time constraints. In addition, the following four volumes were used as sources in preparing this paper.

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