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STRATEGY RESEARCH PROJECT

VERIFICATION OF WEAPONS OF MASS DESTRUCTION TREATIES: A NECESSARY ENGAGEMENT IN AN EVOLUTIONARY ENLARGEMENT

BY

LIEUTENANT COLONEL JOHNNIE L. ALLEN
United States Army

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U.S. ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013-5050

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by

Lieutenant Colonel Johnnie L. Allen
United States Army

Commander David M. Birdwell
Project Advisor

U. S. Army War College
Carlisle Barracks, Pennsylvania 17013

ABSTRACT

AUTHOR: Johnnie L. Allen (LTC), USA

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The United States has signed and become a party to more than 30 multilateral and bilateral arms control agreements since 1959. The lack of absolute effectiveness and confidence of these agreements to limit or ban WMD arsenals or to prevent WMD proliferation has caused many learned arms control scholars to question America's use of these treaties to meet national security objectives. The controversy often focuses on verification of a treaty member's compliance with the terms of the agreement. However, what seems to be a poor record of treaty compliance and adequate verification is in reality, a moderate success in stemming WMD proliferation and is indicative of the continuing evolution of compliance verification as the central factor in evaluating treaty effectiveness. The thesis of this study is that verification of treaty compliance has also evolved as the most important component of arms control, and the U. S. must remained engaged as the world leader to strengthen WMD treaties with verification procedures that provide a high probability of detection and deterrence to potential violators.

Verification of Weapons of Mass Destruction Treaties: A Necessary Engagement in an Evolutionary Enlargement

I. INTRODUCTION.

The United States has signed and become a party to more than 30 multilateral and bilateral arms control agreements since 1959.[1] Most of these agreements have dealt with limitations, controls, reductions or bans on weapons of mass destruction (WMD) and the means to employ them in a conflict. The lack of absolute effectiveness and confidence of these agreements to limit or ban WMD arsenals or to prevent the proliferation of WMD and technology has caused many learned arms control scholars to question America's use of these treaties to meet national security objectives. The controversy often focuses on verification of a treaty member's compliance with the terms of the agreement.

Historically, there are numerous instances of violations during little more than three decades of WMD arms control agreements. However, what seems to be a poor record of treaty compliance and adequate verification is in reality, a moderate success in stemming WMD proliferation and is indicative of the continuing evolution of compliance verification as the central factor in evaluating treaty effectiveness.[2]

The documented evidence of treaty violations demonstrates that noncompliance can be detected when verification procedures give a high probability of detection. Detection of violations is not highly probable when verification procedures are weak and the violating party deliberately attempts to deceive other members.[3] U. S. negotiators are now using past experience and increased international interest in arms control to construct treaties which contain unambiguous verbiage detailing unscheduled, intrusive procedures to verify compliance. Moreover, the international community has realized the weaknesses of compliance verification in existing multilateral treaties and has strengthened or is considering methods to strengthen these treaties with

more intrusive inspections and safeguards. The U. S. President has recognized the need to strengthen existing treaties and wants to seize the opportunity to stem proliferation.[4]

II. PURPOSE.

This paper examines the concept of compliance verification from a historical evolution of treaty designs and compliance violations with respect to the political attitudes of the then existing national leadership, and in recent breakthroughs in accepted verification procedures by nation states party to current bilateral and multilateral WMD treaties. Despite past treaty violations and continued WMD proliferation, U. S. national security has been enhanced by its participation in such treaties. The evolution of international relations and the end of the Cold War have created an opportunity to make the world safer through more effective arms control measures. The thesis of this study is that verification of treaty compliance has also evolved as the most important component of arms control; and the U. S. must remained engaged as the world leader to strengthen WMD treaties and conventions with verification procedures that provide a high probability of detection and deterrence to potential violators. This work is limited to the study of the U. S. and other nations which are members of existing major bilateral and multilateral WMD treaties. It considers only limited compliance by states which are not members of a particular treaty and does not consider any treaty compliance by rogue states which often operate outside the norms of international law.

III. THE VERIFICATION PROCESS.

Verification is a process that establishes whether nations which are parties to an agreement are complying, in fact, with the provisions of that agreement. Compliance is accepted as the positive behavior of a treaty member with respect to the provisions and requirements of an agreement as recognized by international law.[5] The intended purpose of verification is to assure compliance and deter violators by making the costs of violation or evasion of detection higher than the potential gain from cheating.[6] For arms control

agreements in which trust has not been established, verification must establish that any uncertainties about a member's activities and intentions are within militarily acceptable limits of risk to another member's national security.[7] Therefore, for an arms control treaty to be effective, verification must ensure that violations will be detected quickly, and that until detected, violations will not pose a significant threat to the national security of other treaty members.[8]

Monitoring treaty compliance is the first step of the verification process and includes collection of data relevant to another member's obligations to the provisions of an arms control agreement.[9] While monitoring merely equates to watching what is going on, it is the most difficult and historically, the most controversial step of the verification process. Treaty provisions have always limited access to information and the methodology used to collect data.[10] During the early 1970's, when the U. S. and the Soviet Union began a series of nuclear arms control negotiations, the closed Soviet society and its compulsion to maintain state secrets limited treaty monitoring to national technical means (NTM) which are primarily reconnaissance satellites.[11]

The more open Russian society of the 1990's and the willingness of the Russian leadership to negotiate arms control has challenged negotiators to concentrate not only on specific weapons limitations or bans, but also more on the methods of verification which are primarily focused on monitoring the activities of the other nation with respect to the treaty.[12] Monitoring activities today include NTM as the primary monitoring tool complemented by more intrusive data exchanges and on-site inspections. Arms control negotiations now focus more on acceptance and implementation of monitoring techniques than the primary negotiations for controls on weapons.[13] Clearly, the monitoring step of the verification process is the most evolutionary element of arms control.

The second step of the verification process is the analysis of the data gathered through monitoring by comparing that data with previous

data and provisions of the arms control treaty to ensure compliance.[14] This is not a readily definitive step. The ambiguous terms and lack of specificity in many arms control agreements often cloud an analysis to determine what is permitted by treaty provisions.[15] The heightened tensions of the Cold War caused negotiators to purposely write ambiguities into most treaties in order to obtain an agreement acceptable to the leadership of all members.[16] Later, these ambiguities caused major compliance issues.

The nature of the WMD to be controlled and the particular arms control measures used also complicates data analysis. Complete bans on nuclear weapons and systems are the easiest to analyze. Bans on nuclear weapons also eliminate testing, training and maintenance activities which could enable clandestine deployment of prohibited weapons or launchers. Detection of banned weapons clearly indicates a violation. Limitations or reductions of these same weapons create a problem of how to count numbers of missiles or multiple warheads on single missiles.[17] Dual-use technology creates the most difficult situations to analyze whether a nation is producing banned chemical or biological weapons; while such technology is designed to produce legitimate industrial chemicals, pharmaceuticals, and the like, the equipment can be easily converted to production of WMD, then very quickly converted back to industrial use.[18]

Most importantly, the collected data must be analyzed with respect to a nation's national security strategy, military capabilities and doctrine, and its willingness to comply with the provisions of a treaty. Only after this final phase of analysis can a nation determine whether another nation is meeting the terms of the treaty.[19]

This final step of the verification process is judgement of treaty compliance.[20] The judgement must reduce any uncertainty of detection to an acceptable level. All discrepancies and violations must be evaluated as to the seriousness of the threat to a state's national security, and the intentions of the violator must also be evaluated. The evaluation must contrast the violations of the treaty to the dangers of having no treaty and

also determine the weaknesses of the agreement for possible corrective action.[21] Factors for consideration are what can (or cannot) be verified, and the primary requirement to reduce uncertainty to an acceptable level,[22] specifically, 90 percent or higher probability of detection is desired.[23] The completed process must give a nation either a high level of confidence of compliance (ten percent or less uncertainty) or sufficient grounds to address grievances against a suspected violator.[24]

IV. THE ARGUMENT AGAINST ARMS CONTROL TREATIES.

Arms control opponents are quick to point out that modern western democracies have yet to design adequate methods to verify compliance or to implement a policy to respond to a violation.[25] Their arguments are substantiated by numerous documented violations. In the mid-1980's the Soviet Union directly violated the Antiballistic Missile (ABM) Treaty by deploying an illegal radar system, and violated the provisions of the Strategic Arms Limitations Talks (SALT II) by deploying illegal missile systems. The Soviets also deceived U. S. intelligence satellite reconnaissance which was permitted under both treaties.[26] The illegal radar was discovered by U. S. satellite surveillance in 1983, but was de facto condoned until 1987, when President Reagan declared the facility to be in violation. The Soviets, who considered deception as a normal part of statecraft, denied the violation and the situation required two years of negotiation before they conceded to U. S. demands to dismantle the radar.[27] The Soviets also ignored U. S. protests of their illegal deployment of a prohibited mobile missile system, encrypted telemetry during tests, and concealed other activities from U. S. satellites. All of these activities were violations of SALT II.[28]

The U. S. never ratified SALT II and withdrew from the provisions of the treaty in 1986.[29] Most recently, the entire international community was shocked after the Gulf War to learn how easily Iraq had secretly violated existing multilateral WMD treaties.[30] The discovery of Iraq's illegal programs caused world leaders and arms control advocates to seriously consider that multilateral arms control treaties constructed in the 1970's had fallen

markedly short of effective verification. Previous verification efforts had uncovered only minor violations which caused little concern about more intrusive verification measures or the methods to redress violations. These treaties were purposely constructed with minimal or ambiguous requirements for verification to make them politically acceptable to the signatories.[31] While these treaties set standards for international norms, they were not verifiable due to ambiguities in their language and the lack of means to ensure compliance.[32] Bilateral treaties between the U. S. and the Soviet Union constructed during the same period contained only modest provisions for verification by national technical means (NTM) which the Soviets considered to be legal intelligence. The Soviets would not negotiate the use of on-site inspections which they considered to be espionage.[33] Indeed, treaties such as ABM and SALT favored the closed Soviet society to protect state secrets, and they also provided opportunities for the Soviets to take advantage of loopholes which offered ways for clandestine violations.[34]

Arms control opponents often cite that treaties lack provisions to correct noncompliance issues, and that the U. S. has no policy for corrective or punitive actions. U. S. leaders were painfully slow to act decisively on the ABM and SALT violations, seemingly choosing to ignore the violations in favor of maintaining the treaties.[35] Outside of further negotiations or withdrawal from the treaty, there were no other means for corrective action. While more recent treaties have concomitant bilateral commissions to address alleged violations, these treaties also have provisions which prohibit U. S. authorities from informing the American public of the allegations until the situation is resolved.[36]

The number of violations which occurred during the 1980's caused the U. S. to withdraw from one major bilateral treaty and finally obtain corrective actions on another. Opponents of arms control voiced valid concerns that no verification process or regime can guarantee total confidence in detecting determined violators, but U. S. NTM were sufficient to detect Soviet violations during the last decade.[37] More importantly, Soviet

violations were detected before they posed a serious threat to U. S. national security. The U. S. did not enter into any bilateral treaties from 1981 to 1987, when the Soviets changed their attitude toward compliance and acceded to more intrusive verification procedures.[38] After the 1991 Gulf War, the discovery of Iraq's extensive clandestine nuclear and biological weapons programs, and its known chemical weapons stockpile caused arms control experts and international leaders to appreciate the need to strengthen existing multilateral treaties with more comprehensive and intrusive verification procedures.[39] Work is currently ongoing to improve verification procedures for the world community, and to close the loopholes in multilateral treaties.[40]

V. EVOLUTION OF WMD TREATIES AND VERIFICATION.

A review of the significant arms control treaties within the past three decades demonstrates that arms control negotiators and international leaders designed WMD treaties to reflect the political and social sensitivities of national sovereignty and security, at the time of treaty negotiation and enactment. What was enacted, especially the provisions for verification, had to be acceptable to the most sensitive and secretive members of the agreement. The closed societies of the 1970's and early 1980's have politically and socially evolved into more open societies willing to cut defense spending and enhance international security. This willingness is further demonstrated in the design of the most recent bilateral arms control agreements and in subsequent actions to strengthen existing multilateral treaties to ensure compliance by all members.

Multilateral Treaties

The Non-Proliferation Treaty (NPT)

The NPT was negotiated through the United Nations in 1970, and has increased its original membership of 40 member nations to 169 members.[41] The NPT is essentially an agreement between the original five nuclear weapons states (U. S., China, France, United Kingdom, and the Soviet Union, now

Russia) and the remainder of the world community to share nuclear technology for peaceful purposes in return for the nonnuclear states' promises to not pursue development of nuclear weapons.[42] The goals of the NPT are timely detection of diversion of fissile material into weapons development and nuclear safety in the design and operation of peaceful nuclear reactors.[43] Not all world nations are NPT signatories; Israel, India, Pakistan and Algeria have never signed the treaty. Israel and India subsequently produced nuclear weapons, while Pakistan possesses the infrastructure to produce weapons. Algeria is continuing research to develop production capability.[44] Iraq's program was the first proven case of a direct violation by a NPT signatory.[45]

The International Atomic Energy Agency (IAEA), an autonomous program affiliated with the UN, oversees compliance with the NPT through a series of safeguards designed to prevent diversion of fissile material and technology into nuclear weapons proliferation.[46] The IAEA fulfills the NPT's mandates to oversee the peaceful use of material and technology through safeguards which include inspections and export controls. Through the IAEA, the five nuclear weapons states (NWS) may export nuclear material, equipment and technology to nonnuclear weapons states (NNWS). These exports are placed under safeguards and are subject to IAEA audits and inspections.[47] Any reexport must be approved by the original NWS exporter and continued under IAEA safeguards.[48] Export to non-NPT members is only permitted if the nonmember accepts IAEA safeguards.[49] Such safeguards range from IAEA audits on state facilities' accounting of nuclear material and announced inspections at declared facilities,[50] to full-scope regulations which include unannounced inspections on declared facilities and their associated structures.[51] Safeguards are not required on NWS facilities or exports between NWS.

The IAEA conducted its mission for nearly two decades with no documented evidence of safeguarded material being diverted.[52] However, weaknesses and loopholes in the safeguards regime permitted India to begin its weapons development program with material obtained legally from a Canadian reactor.[53] Pakistan is suspected to have acquired material and technology to make weapons

from a series of planned illegal transfers.[54] The U. S. strengthened the NPT through enactment of the Nuclear Non-Proliferation Act of 1978 which ended U. S. nuclear trade with NNWS not under full-scope safeguards or to a non-NPT state which had detonated a nuclear weapon.[55] Still, the world community did not take suspected violations seriously until Iraq was forced to reveal its program after the Gulf War. The inspection of Iraq's research laboratories and production facilities demonstrated that the IAEA and other arms control regimes did not fail in their mission, but they did not hinder Iraq's illegal WMD programs.[56]

The IAEA safeguards apply only to known materials in declared facilities and the regime can therefore only audit or inspect what is known to be present. Some states are either not NPT members, or have not accepted full-scope safeguards.[57] Prior to the discovery of Iraq's violations, the IAEA had not developed a verification process to determine if potential clandestine activities existed at undeclared locations.[58] The IAEA never conducted a permitted unannounced inspection on an undeclared facility suspected of illegal activity. However, no intelligence was provided by NPT members regarding suspicious activities of other members.[59] IAEA inspections were conducted at regular intervals; and although some unannounced inspections were conducted at declared facilities, they could only be conducted in an unannounced mode in nations which did not require an entry visa.[60] IAEA inspectors were permitted to inspect only certain strategic points at declared facilities. Consequently, an Iraqi building adjacent to a declared reactor was later found to be a plutonium separation research laboratory.[61] Temporary placement of intrusive monitoring equipment in facilities was minimal to satisfy nations' concerns about national security.[62] Some European countries were either not safeguarding material or making sales just below the limits requiring safeguards.[63] Designs of nuclear facilities were usually submitted for IAEA safety approval after construction was completed.[64] Lastly, the IAEA's mission has doubled since 1985 while its budget has remained flat, causing some safeguards upgrades to be scaled back.[65]

Since the inspection of Iraq's facilities, corrective action has been taken on several weaknesses. Full-scope safeguards are now a required condition for export and the list of materials to trigger safeguards has been expanded. NPT states voted in 1992 to reaffirm the IAEA's power to make greater use of its special inspection power. The first such inspection was attempted in 1993, based on allegations of illegal activity in North Korea, and when team members were refused entry, the case was referred to the UN for resolution.[66] Satellite information and other intelligence has been requested from other member nations to supplement information on worldwide nuclear activities. The IAEA is also considering the use of more intrusive on-site and off-site inspections to include environmental monitoring techniques. New NPT provisions now provide inspectors greater access and require NPT members to provide facility design information prior to construction.[67] A lack of proper funding may surface as a problem which could affect equipment purchases and frequency of inspections. Some consideration must be given to the current skewed allocation of resources to countries which pose no proliferation concern. While this policy is nondiscriminatory, it is an inefficient use of resources in an era of diminishing fiscal capabilities.[68]

Arms control agencies and concerned nations are continuing efforts to strengthen the IAEA inspection program to widen the scope of inspections. For instance, no safeguards currently exist for over 20 different dual-use materials and devices critical to nuclear weapons production, devices which have broad civilian applications,[69] and civilian industry may resist government support of safeguards for these items. While no safeguards system can detect all violations, it should be noted that in 1993 the IAEA, on a budget of less than $400 million, conducted over two thousand inspections and successfully safeguarded enough nuclear material to construct more than 65 thousand nuclear weapons.[70] Considering the quantity of safeguarded material and its potential for proliferation, it is essential that the U. S. maintain its support, even if it must fund a disproportionate amount of the IAEA's budget.

The Chemical Weapons Convention (CWC)

The CWC originated in 1925 as an international effort to ban the use of chemical weapons in warfare. The convention did not prohibit research, production, or stockpiling of chemical weapons in national arsenals. Considering the ban's lack of self-enforcement, it is remarkable that so few violations have been reported or substantiated. Modern defenses have limited the utility of these weapons, and the technology is so widespread that such use would likely draw a retaliatory response from an opponent's arsenal. Regardless of the rationale for restrained use, huge stockpiles remain in the U. S., Russia and in more than two dozen other nations which have either produced or are developing chemical weapons.[71] Russia alone has a reported stockpile of more than 40 thousand metric tons of chemical agents.[72] The discovery of Iraq's extensive chemical weapons program and continuing worldwide proliferation initiated a UN effort to strengthen the CWC.

The UN attempted to strengthen the CWC during the 1980's to stem growing proliferation, but the efforts usually fell victim to a Soviet veto. Finally, in 1987, a more open Soviet leadership agreed to favor UN challenge inspections in CWC nations alleged to have used chemical weapons.[73] Work continued on a new CWC prior to and after the Gulf War. The new CWC was opened for signature in Paris in 1993, and was signed by 159 member nations.[74] The 1993 CWC bans all activities associated with weapons production and storage. This verification process was developed from the most current U. S.-Russian nuclear weapons treaties and includes provisions for routine and unannounced intrusive inspections, on-site and off-site monitoring, export control and an affiliated inspection regime.[75] The civilian chemical industry will also be subject to "anytime, anywhere" inspections, but will be afforded adequate time to protect proprietary information.

The new convention currently has not been ratified by enough states, including the U. S. and Russia, to become international law. In the U. S., it remains a hostage to questions from the Senate Foreign Relations Committee about the modern Russian stockpile and speculation as to whether Russia will

also ratify the treaty. The entire world is awaiting the U. S. and Russian ratification before following suit to make the convention law and to enforce the destruction of signatories' chemical arsenals.[76] The convention's verification process provides a more solid framework for monitoring activities in facilities than the IAEA, but specific inspection procedures and monitoring equipment must still be developed. Dual-use equipment and precursor chemicals present a special problem because of the ease of conversion. These potential problems suggest that, in the future, specific verification procedures and techniques should be completed and accepted prior to design of the basic treaty. Regardless of the details of verification, the CWC is a significant step forward from its 1925 predecessor and should be ratified immediately to start the clock for destruction of existing weapons.[77]

The Biological And Toxin Weapons Convention (BWC)

The BWC bans all activities associated with production of biological weapons except for research and production for disease control and prevention. The present convention was negotiated in 1972 when there was a widespread view that biological weapons had little military utility and that intrusive on-site inspections were not politically acceptable. This attitude continued as U. S. policy through 1993;[78] with no means to verify compliance, illegal activities went unchecked for nearly two decades. In 1992, Russian president, Boris Yeltsin, admitted to a Soviet-Russian program which some arms controllers insist still exists today.[79] Iraq produced more than 20 thousand liters of botulinum toxin and concentrated anthrax between August 1990 and January 1991, and had weaponized these toxins by December 1990, only one month prior to the start of Operation Desert Storm.[80]

Biological weapons present a more difficult verification problem than chemical weapons. Production does not require an elaborate infrastructure, all equipment is legal, dual-use and easily convertible, and no precursors are required for production.[81] Further technology is simple and easy to acquire; virus samples can be acquired through the U. S. Postal Service.[82] Medical and veterinary researchers can legally produce viruses and toxins to develop

antibodies.[83] Viruses and toxins can be covertly produced in facilities such as milk processing facilities, breweries, and insecticide and agriculture plants, which can be converted to illegal activities in a few days.[84] Production facilities give no distinct signature like nuclear facilities and are difficult to detect through satellite imagery. Human intelligence is essential for reliable information on facilities or programs.[85]

Concerns over proliferation resulted in international efforts to strengthen the BWC. The 1986 BWC Review Conference introduced confidence building measures (CBM's) that required nations to make annual declarations of high containment facilities. After the Gulf War, the 1991 BWC Review Conference convened a body of verification experts (VEREX) to study methods for conducting both off-site and on-site monitoring and inspections. VEREX concluded that the dual-use nature of research and facilities required a wide range of verification measures to ensure compliance. In 1994, the U. S. changed its policy and endorsed a VEREX proposal to promote a verification regime similar to the IAEA to oversee compliance verification. This proposal will form the framework for a new BWC which is not expected to be finalized until 1998.[86] Inspection and monitoring procedures will again be the focus, but the greatest hurdle to overcome may be the decision on which facilities will be subject to verification. National laboratories are not expected to be a problem. However, commercial industries have already raised objections to intrusive inspections and monitoring techniques. Indeed, they have valid concerns about the potential for industrial espionage. Today, major U. S. pharmaceutical manufacturers average a $350 million investment, 10 to 12 years of research and development, and governmental approval to market a new product.[87]

The Missile Technology Control Regime (MTCR)

The MTCR was formed in 1987 as an informal non-treaty association of governments interested in limiting the spread of WMD through the control of missile delivery systems capable of delivering payloads of over 500 kilograms to distances exceeding 300 kilometers.[88] The regime has no means of

verification and relies on its voluntary member nations to regulate trade and share information to deny technology and equipment to nations which are pursuing ballistic missiles for offensive and retaliatory purposes.[89] In addition to a lack of compliance verification, the MTCR is further limited by its charter not to impede technology transfers for peaceful space launch vehicles which include an almost uncontrollable amount of dual-use technology. Also, many of the world's major suppliers are not signatories.[90] The U. S. Department of State supervises all transfers and sales of related technology by American industry; and the U. S. Department of Commerce ensures foreign signatories do not take commercial advantages by permitting sales from their industries after the U. S. has denied a similar commercial sale to the same country.[91]

The Bilateral Treaties Between the U. S. and the Soviet Union-Russia

The Antiballistic Missile (ABM) Treaty

The ABM treaty was enacted by the U. S. and Soviet Union in 1972. It marked a significant breakthrough in the icy detente between the two nations by limiting the deployment of ABMs, associated radars and tests of such systems to assure each nation that one would not offset the strategic balance of terror. The treaty's focus was competition prevention rather than arms reduction. Compliance verification was restricted to NTM which was sufficient for the U. S. to detect Soviet violations during the 1980's. Despite past Soviet violations, today's arms control advocates still support strict U. S. adherence to this agreement as the "mother of all bilateral treaties" which has provided the framework for more recent treaties which are presently in effect.[92]

The Strategic Arms Limitation Talks (SALT I and SALT II)

The SALT I agreement, like the ABM Treaty, was negotiated by the Johnson Administration and signed with the Soviets in 1972. Enacted as an interim agreement, SALT I focused on competition prevention by maintaining the strategic parity of nuclear forces through a freeze on respective numbers of actively deployed intercontinental ballistic missiles (ICBM's) and submarine

launched ballistic missiles (SLBM's) at the then present levels. Upgrades were permitted within the limits of total numbers of launchers. Verification was conducted through NTM and provisions of the agreement prohibited NTM deception by the other nation. SALT I supposedly gave the U. S. a strategic advantage due to its advanced technology in multiple warheads per single launcher.[93]

SALT II was negotiated between 1972 and 1979 and sought a quantitative limit on numbers of long-range bombers, ICBM's and SLBM's. The agreement also attempted to place qualitative limits on destabilizing force developments such as multiple warheads. U. S. negotiators failed to consider adequate provisions for verification of qualitative improvements in Soviet system technology, particularly in multiple warheads. NTM could not verify the type of missile in a launcher or which launchers contained multiple warheads. A number of counting rules were developed in an inadequate attempt to simplify verification of warhead numbers. Since the limitation was placed not on total numbers of warheads but on total numbers of launchers containing multiple warheads, each launcher that had been tested or associated with multiple warheads was counted as containing the maximum of warheads. More uncertainty was created by the attempt to assess the throw-weight (nuclear yield) of missiles with potential multiple warheads. Lastly, the inability to detect hidden mobile missiles, launchers, and reloads caused opponents of SALT II to consider the agreement as destabilizing as having no treaty at all. The U. S. Senate never ratified SALT II and President Reagan called the agreement "fatally flawed" because he believed that the Soviets would intentionally violate the agreement. The U. S. did adhere to the agreement's provisions until 1986, when it rejected both SALT I and SALT II under numerous allegations of Soviet violations of both agreements. Many of these allegations originated from the ambiguous verbiage of the agreement which the Soviets subjected to their interpretation and used to their advantage.[94] Here, another lesson learned from SALT was that the Soviets would most likely comply with the letter, not the spirit of the treaty.

The Intermediate Nuclear Force (INF) Treaty

The INF Treaty, ratified in 1988, represents a historical breakthrough in arms control as the first bilateral treaty to ban an entire class of nuclear weapons. More importantly, the INF is the first U. S.-Soviet treaty to establish a verification regime involving on-site inspections (OSI's) by the respective nations and cooperative measures to complement NTM.[95] The ban extends to deployment, production and stockpiling of ground launched nuclear-capable missiles with ranges between 500 and 5,500 kilometers, and includes similar bans on testing and facilities associated with these missile systems. Warheads are not included in the ban and are not required to be destroyed with the missiles. OSI's began with an initial baseline inventory of all missiles, launchers and locations. Observers are permitted to witness missile and launcher destruction and to confirm the close-out of an operating or support facility. Inspectors may conduct short-notice "challenge" inspections at specified sites. Exits at missile production facilities may be monitored 24 hours a day by resident inspectors from the other nation.[96] The INF set a standard for OSI to be a major provision for all future arms control treaties.

The Strategic Arms Reduction Talks (START I and START II)

The START agreements are the result of evolving cooperation in foreign policy and arms control between Washington and Moscow.[97] The agreements also represent the Reagan Administration's view that strategic nuclear arms reduction vice limitation was the future national security objective.[98] START produced two significant "firsts" in strategic arms control: counting warheads as well as delivery systems, and verification through on-site inspection teams. START I reductions limited each nation to 6,000 deployed warheads and 1,600 deployed delivery vehicles, to include heavy bombers. Ballistic missile arsenals were restricted to a total of 4900 warheads with the balance in bomber-delivered systems. Nondeployed missiles and specific silos are to be destroyed, but the Russians can maintain limited numbers of mobile launchers to keep their remaining force upgraded and they can retain some silos for

launch of space vehicles. START II will reduce national arsenals to 3,000 - 3,500 strategic warheads and ban multiple warheads on land-based ICBM's.[99]

START required ten years of negotiation primarily due to development of verification procedures and inspection regimes. The more transparent Russian society and its willingness to reduce national defense costs facilitated its acceptance of intrusive verification beyond NTM.[100] Verification procedures include initial data exchanges on locations, and numbers of delivery systems warheads and yield. OSI's consist of a baseline inspection, a series of routine scheduled inspections and special challenge inspections, and observation of the destruction of delivery vehicles.[101] After START I's ratification, inspection teams began the inspection process on March 6, 1995. Each nation must provide 24 hours notice before the arrival of a challenge inspection team in the target nation. After arrival, the challenge team announces the desired location for the inspection and the hosting nation must provide access to that location within nine hours of the request.[102]

The START treaties are not perfect. The treaties require the dismantlement and destruction of delivery systems, not the warheads. START has no provisions to verify Russian compliance with the banned transfer of missiles or warheads. In 1992, Secretary of Defense Dick Cheney and General Colin Powell, Chairman, Joint Chiefs of Staff, testified before the Senate Armed Services Committee to address these concerns. Cheney believed that all mobile launchers and any associated missiles could be effectively monitored against transfer, or banned removal from garrison locations. He further stated that the limit on mobile launchers was a specific provision to facilitate U. S. verification. General Powell likened the destruction of missiles and retention of warheads to getting rid of a gun but keeping the bullets. He believed that NTM, OSI and cooperative measures would prevent Russian rearmament with multiple warheads.[103] The 1991 Nunn-Lugar Cooperative Threat Reduction (CTR) Program Act has enabled U. S. experts to assist the Russians in keeping pace with START I reductions by providing equipment and funds to facilitate destruction of delivery systems, and to

secure warheads removed from these systems. This effort is expected to continue for a number of years and should provide more verification intelligence to the U. S. [104]

START II was ratified by the U. S. Senate in January 1996. START II widens the scope of START I with an additional 50 percent reduction of warheads. The delay in the U. S. ratification process has delayed ratification by the Russian parliament which now has been further delayed by Russian presidential elections scheduled for June 1996.[105]

V. CONCLUSION.

In 1962, President Kennedy warned of the possibility of up to 25 nuclear weapons states facing the U. S. by the 1970's. By 1992, there were the five declared nuclear weapons states, three newly confirmed possessor states, and at least six others known to have the capability to produce nuclear weapons.[106] The aggregate number is little more than half the number of nations originally predicted to possess nuclear weapons. While the numbers vary according to different sources, roughly 25 nations possess chemical and biological weapons or production capability. Considering the extent of chemical and biological weapons proliferation and the relative ease of production of these weapons, it is surprising that so few incidences of their use have been reported in the past three decades. Although numerous WMD treaty violations have occurred and WMD proliferation continues, active U. S. participation in the major multilateral treaties has moderately stemmed the proliferation of WMD. U. S. national security has also been greatly improved by the most recent bilateral treaties with Russia to reduce nuclear stockpiles.

The discussion of major multilateral and bilateral treaties has demonstrated the evolution of compliance verification as the central component of arms control, especially in the most recent bilateral treaties between the U. S. and Russia. These bilateral treaties of the world's two greatest nuclear powers are excellent examples for the world community to use to upgrade current WMD multilateral treaties with intrusive verification measures to ensure international stability and lawful compliance. Experience has shown

that a nation bent on acquiring WMD will violate a treaty if it considers proliferation to be beneficial. Future treaties must make the cost of violation prohibitively expensive and severe punitive actions must be automatically invoked.[107]

The U. S. must continue to build international acceptance of intrusive verification measures as a litmus test for commitment to compliance with current treaties.[108] The U. S. ratification of the new CWC is crucial to this treaty's enactment as international law. Only then will Russia and the large majority of holdout nations also ratify the CWC. The U. S. must lead the way for the world to determine the methodology for verification of a new BWC. A key U. S. priority after the Russian presidential elections must be the Russian ratification of START II, even if a new Russian leader is elected.

Lastly, the U. S. must focus on development of regional stability by encouraging regional nations to renounce WMD and eliminate WMD stockpiles. The Middle East is a great challenge for arms control because of Israel's nuclear weapons capability and the proliferation by states considered to be rogue nations. For instance, the U. S. has never leveraged the $3 billion annual aid given to Israel.[109] The U. S. must use its expertise in arms control to assist in the development of regional confidence building measures which could evolve into regional arms control agreements with verification measures that match global and bilateral standards.[110] For the world's foremost global power, the spread of WMD in the Middle East may effect all elements of national power and may become the principal challenge to U. S. national security during the next century.

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