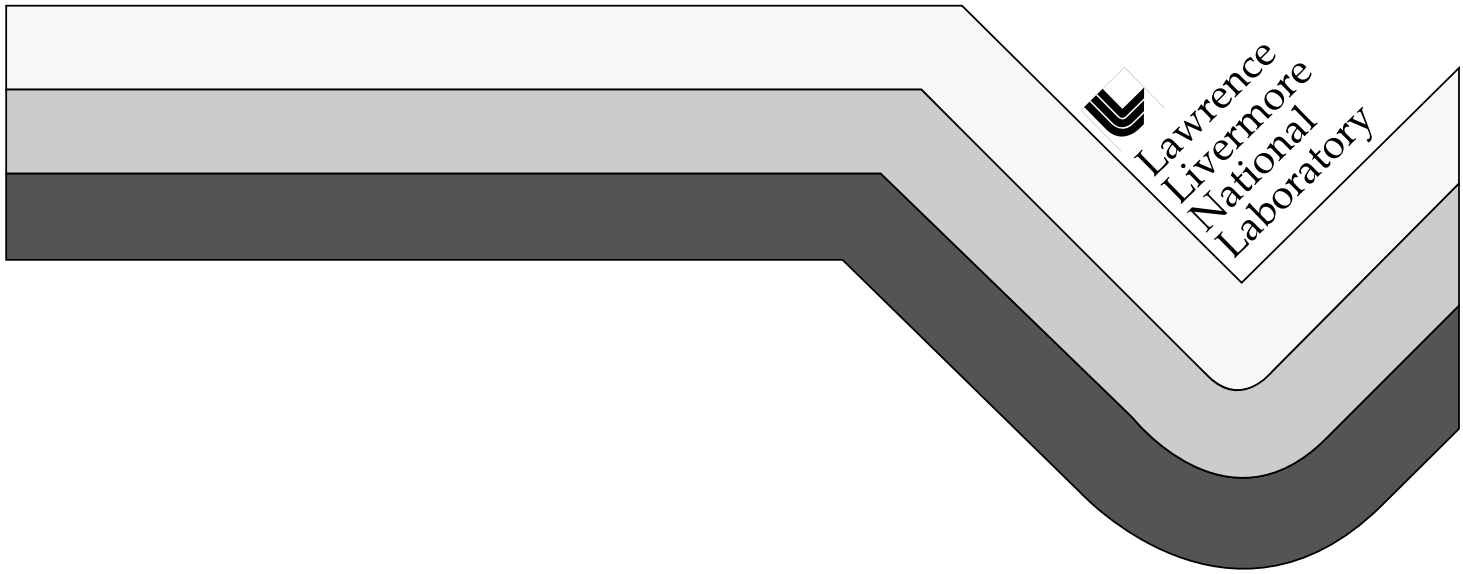
UCRL-LR-132030

De-Alerting of U. S. Nuclear Forces: A Critical Appraisal

K. C. Bailey
F. D. Barish

August 21, 1998



Work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract W-7405-ENG-48.

UCRL-LR-132030
Distribution Category UC-700

De-Alerting of U.S. Nuclear Forces: A Critical Appraisal

K. C. Bailey
F. D. Barish

August 21, 1998

LAWRENCE LIVERMORE NATIONAL LABORATORY
University of California • Livermore, California • 94551

De-Alerting of U.S. Nuclear Forces: A Critical Appraisal

Kathleen C. Bailey and Franklin D. Barish

Introduction

Since the end of the Cold War, there have been pressures by disarmament advocates to move more quickly to draw down, toward zero, the number of nuclear weapons in U.S. and Russian arsenals. They criticize the process of negotiating arms control agreements as being too slow, and point out that treaty implementation is hampered by the necessity of ratification by the U.S. Senate and Russian Duma.

One method of moving more rapidly toward nuclear abolition suggested by some analysts is de-alerting of nuclear-weapon delivery systems. De-alerting is defined as taking steps that increase significantly the time required to launch a given delivery vehicle armed with a nuclear warhead. Although there is little inclination by the U.S. Government to de-alert its nuclear forces at present, some academic literature and press stories continue to advocate such steps.

This paper offers a critique of de-alerting proposals together with an assessment of the dangers of accidental, unauthorized, or unintended use of nuclear weapons. It concludes that de-alerting nuclear forces would be extremely de-stabilizing, principally because it would increase the value to an opponent of launching a first strike.

Why Nuclear Weapons are on Alert

Deterrence is the act of dissuading potential aggressors by convincing them that you have both the will and the capability to retaliate with consequences that they view as unacceptable. If an aggressor perceives that it can incapacitate you before you retaliate, deterrence is undermined.

To assure the ability to retaliate in event of a first strike by an opponent, the United States and Russia have sought to assure that their nuclear forces are survivable—meaning that some significant portion of their nuclear weapons will not be incapacitated. Historically, survivability has been enhanced by several measures (see Table 1), including, for example, maintaining a mix of weapons delivery systems—a triad (see Appendix A for a description of the triad). And, both nations have sought to enhance the stealth of delivery systems. In the case of the United States, there is heavy reliance on the presumption that U.S. nuclear submarines at sea cannot be located and destroyed by an enemy attack. Russia, too, relies on submarines, but also has mobile nuclear missiles, which, as we know from the near-futile experience of

trying to find Saddam Hussain's mobiles during Desert Storm, are extremely difficult to locate.

Table 1: Measures to Ensure Survivability of Nuclear Forces

Possess a mix of delivery systems (triad)
Harden the silos of land-based intercontinental ballistic missiles
Make delivery systems stealthy, hard for the enemy to find
Keep systems alert, ready to fire

Another key means of insuring survivability is keeping some portion of nuclear forces on alert, ready to fire quickly before they can be destroyed. Keeping nuclear delivery systems on alert enhances survivability and enables retaliation in extreme crisis situations. For example, a first strike may eliminate a large proportion of U.S. nuclear forces. If some surviving nuclear systems are not alert, ready to retaliate, they could be eliminated in a second enemy strike. As long as U.S. nuclear forces are on alert, enemies know that they are highly unlikely to succeed with pre-emption, nor are they likely to escape retaliation if it is warranted.

Is Alert Status Dangerous?

Nuclear weapons opponents have sought to characterize alert status as being equivalent to a "hair-trigger" situation. They argue that readiness to fire a weapon makes it not only possible, but also easy for hasty, accidental, or unauthorized use. They further contend that these dangers can be eliminated or minimized by de-alerting weapons delivery systems and/or placing warheads "in escrow" away from their delivery systems.

To evaluate the claims that alert status is dangerous, it is necessary to address three key questions. The first is: Are warning systems and procedures adequate to assure that decision-makers have sufficient time to assess whether a possible attack is real and warrants an immediate nuclear response? If they are not adequate, then there may be incentive to order a nuclear strike as a means of insuring that nuclear forces are used rather than lost in the presumed first strike by an enemy.

The second question is: Can nuclear weapons be fired without a methodical sequence of actions whose execution must be intentional? If so, then an accident is feasible. If not—if a conscious set of unambiguous steps must be taken—then the likelihood of an accident is low or nil.

The third question is: Are nuclear weapons stored in a highly controlled manner that also restricts use? This question must include the notion that if unauthorized

access is achieved, and then the weapons must be extremely difficult or impossible for the unauthorized individual(s) to use.

The Adequacy of Early Warning

The United States and Russia have satellite- and ground-based systems to detect and track the launch of ballistic missiles toward their territories, as well as some capabilities to warn of approaching aircraft. Additionally, both nations have communications established that enable them to raise questions and seek clarification should there be unexplained activity that appears threatening.

Critics who favor de-alerting cite an incident in January 1995 as evidence that early warning in Russia is inadequate and could lead to hasty Russian nuclear use.[1] The incident involved a Russian alert response to a research rocket fired from Norway. But, while some people viewed President Yeltsin's order for an alert as excessively dangerous, others noted that it was actually an example of the system working as it should—a missile firing was observed and the leadership stepped up readiness in event that it was actually an attack.

In the two years following the 1995 incident, many articles appeared in Western academic and news media alleging deficiencies in Russian C^3, particularly Russian early warning systems. Russian experts attempted to allay fears. For example, in August 1997, Major General Vladimir Dvorkin, Chief of the Fourth Central Research Institute (for the Strategic Rocket Forces) of the Russian Ministry of Defense, made a trip to the United States to address a group of defense specialists at the U.S. Naval Postgraduate School. His speech dealt extensively with Russian C^3. Points he made included: Russia does not rely principally on launch on warning, but rather on the survivability of its mobile forces; the U.S. view of Russian C^3 as seriously vulnerable is erroneous; C^3 is very centralized in Russia and there is no possibility that "underlings" can gain control; Russian warning systems are multi-layered; there are positive and negative hardware controls on tactical nuclear systems that prevent their misuse. He closed with the remark that the United States

---

[1] The perception that the incident represented a failing of Russian C^3 capability was bolstered by a statement on 6 February 1997 by then-Defense Minister Igor Rodionov, who asserted, "if the shortage of funds persists...Russia may soon approach a threshold beyond which its missiles and nuclear systems will become uncontrollable." It is unclear whether Rodionov was simply using the incident to angle for increased funding, or whether he was expressing genuine fear regarding diminished C^3. However, Rodionov's statement was immediately repudiated by high-level Russian officials. The then-Strategic Rocket Forces Commander and now Defense Minister Igor Sergeyev said the C^3 system was not on the verge of failure. His remarks were supported by President Yeltsin and Prime Minister Chernomyrdin. Rodionov himself, in March, declared that the Russian nuclear forces are "reliable and stable" and excluded "the possibility of unusual situations." Later, during a trip to the United States in May, Rodionov reassured the United States that the C^3 system was not a problem.

should do a better job of understanding the complexity and competence of the Russian C^3 system.

Russian military experts have continued to discuss openly their nation's early warning capabilities. In a July 1998 interview, the Russian Strategic Rocket Forces Commander, Gen. Vladimir Yakovlev, stated that the missile attack early warning system (MAWS) is somewhat disadvantaged by the impending closure of a MAWS station in Skrunde, Latvia, but that there were compensations planned. He noted that a new station in Baranovichi, Byelorussia would be built and that the stations in Mukachevo, Gabal, Balkhash, and Sevastopol, as well as those in eastern Russia, remained in service and therefore "the situation is not dangerous."[2]

Both Russia and the United States have viewed effective early warning systems as integral not only to their own defenses, but also to assuring stability and preventing hasty, dangerous decisions on nuclear use. Cooperation and communication to maintain effective early warning remains in the security interests of both nations.

Controls to Prevent Accidental or Unauthorized Use

Neither U.S. nor Russian nuclear weapons can be fired accidentally, nor can an illegitimate order to fire be acted upon. There are numerous checks and balances to assure a very high level of control over weapons (see Table 2).

Nuclear weapons require a series of steps not only to issue the order to fire (and for the recipient to authenticate the order once received), but also to execute the order. For example, instruction codes to issue a command to fire U.S. nuclear weapons are kept in a safe. To open the safe requires that an order from the commander-in-chief (or his successor) be received and de-coded. Two individuals, each with complementary components of the combination or key to the safe must then participate in opening it. (In Russia, there are three individuals.) A single person cannot do the action, nor can it be done by only the two people with the key; others must be aware and complicit in the action. The weapons themselves also have codes and/or mechanical devices, which must be implemented or activated correctly to enable the weapon to be fired.

[2] "There is No Point in Building Up Nuclear Muscle," interview with Gen. Vladimir Yakovlev in *Novye Izvestia*, July 2, 1998.

Table 2: Measures to Prevent Unauthorized or Accidental Use

- Personnel Reliability Program—assure appropriate background
- Technology and personnel for physical security
- Multiple personnel required for access to weapons codes
- Physical security on weapons (cannot fire without codes)
- Automatic weapon-disable systems

Preventing unauthorized use is largely a matter of physical security. Highly trained protective personnel guard U.S. and Russian nuclear weapons systems. There are in both nations extensive operational procedures exercised regularly to assure security. Also, high technology items such as sensors and deterrent devices are used to prohibit unauthorized entry to facilities and, in event of breach, to prevent the weapons from being usable.

De-alerting advocates have claimed that Russian nuclear weapons are not secure for a host of reasons, including: the Russian armed forces are either not paid or are poorly paid, the Russian economy is so weak that expenditures on maintaining physical security have declined dangerously, and Russian federal control over nuclear weapons is so lax that there is even the possibility that the weapons will be sold illicitly. In absence of clear evidence to the contrary, these claims have caused much worry even by U.S. proponents of maintaining weapons on alert.

As noted above, Russian military officials have taken care since 1995 to communicate more clearly on Russian nuclear doctrine and related issues. These transparency efforts have included two very important visits by the Commander of the U.S. Strategic Command, General Eugene Habiger, to Russia, one in November 1997 and the other in June 1998. The latter trip included Habiger's successor, Admiral Richard Mies. Some of Habiger's observations regarding the second trip, which included unprecedented visits to nuclear storage sites, reveal that the Russian measures to prevent unauthorized access and use are comprehensive and effective. Like the United States, Russia uses a variety of measures at different sites: fences with sensors, heavy doors weighing several tons each, and anti-terrorist commando groups. In Gen. Habiger's view, these measures are as effective as those used in the United States.

Gen. Habiger's overall observation was that Russian nuclear weapons security is "excellent." He observed that Russia relies more extensively on personnel—having two security guards at each ICBM silo, for example. Personnel working with nuclear weapons have a low-turnover rate and have specialized in their subject areas, both of which lead to competence and stability. Furthermore, they are well paid. Unlike other segments of Russia's armed forces, those who tend nuclear weapons continue to live in closed cities with assured amenities. Also, they regularly receive base pay plus 25%.

While there may be no observable decline in U.S. and Russian control over their nuclear weapons, why not undertake de-alerting measures anyway? Seemingly, this would add a layer of insurance that nuclear war would not be initiated by accidental or unauthorized use. Answering the question requires an examination of individual proposals for de-alerting and analysis of their impact on deterrence and stability. First, however, the term *de-alerting* should be defined in more detail.

Unilateral Reductions, Deactivation, and De-alerting

Advocates of de-alerting often mix together under the rubric "de-alerting" three distinct types of nuclear-related initiatives:

- unilateral reductions
- deactivation, and
- de-alerting of systems planned for retention in the active force

Unilateral reduction is the removal of a weapon type and/or delivery system from planned or existing nuclear forces without arms control agreements. Unilateral reductions result from changes in perceived need, technologies, and/or budgetary priorities. They may also be undertaken as an altruistic act, with hopes that potential enemies will follow with equivalent reductions. An example of a unilateral reduction would be the early elimination of a weapon or system likely to be negotiated away under START III.

Deactivation is the early removal from alert status of a weapon or system designated for destruction or retirement as a result of an arms control agreement or a decision for unilateral reduction. There is no need to assure that deactivated forces can be regenerated and they are no longer considered as a component of the deterrent force structure.

De-alerting, as noted earlier, is increasing the time that it takes to launch a nuclear weapons delivery system in the active stockpile. That is, the system is neither slated for unilateral reduction nor a reduction that is part of an agreed, ratified arms control agreement.

In September 1991, President Bush announced unilateral nuclear initiatives whereby the United States eliminated its entire inventory of ground-launched non-strategic nuclear weapons, removed all non-strategic nuclear weapons deployed on surface ships and submarines, removed all strategic bombers from their alert posture, and terminated the rail-mobile Peacekeeper, the mobile small ICBM, and the SRAM-II short-range attack missile program. A few months later, in January 1992, Bush ordered limitations on the production of the B-2 bomber, the advanced cruise missile, and the Peacekeeper missile.

Table 3: Changes in the U.S. Nuclear Deterrent Ordered by President Bush

Unilateral Reductions

- Withdrawal and destruction of all ground-launched nuclear weapons
- Withdrawal and destruction of all navy tactical nuclear weapons except for a small number of SLCMs
- Removal and destruction of some air-delivered nuclear bombs
- Removal and destruction of the SRAM A missile
- Termination of rail-mobile Peacekeeper
- Termination of mobile small ICBM
- Termination of SRAM-II short-range attack missile
- Limits on production of B-2 bomber
- Limits on production of advanced cruise missile
- Destruction of most nuclear SLCMs removed from submarines

De-activation

- Stand-down of the 450 Minuteman II missiles due for destruction under START I

De-alerting

- Storage of some nuclear SLCMs removed from submarines *
- Removal of bombers from alert status and placement of bombs and ALCMs in storage

* Most of these weapons were actually destroyed and therefore constitute unilateral reductions.

As noted above, the United States de-alerted its non-strategic nuclear weapons (SLCMs and gravity bombs) from surface ships and submarines. Most of these weapons have been destroyed, but some are in storage. The objective in de-alerting these weapons was in large part financial. By removing them, the military was able to save significant sums in training and security for weapons handling. Similarly, the de-alerting of bombers was a measure undertaken for cost-savings, as well as safety.

The deactivation and destruction of Minuteman II was a multi-staged effort. Launch-enable control panels were removed from Launch Control Centers. Safety control switches were installed at these launch facilities over a few-day period. Finally, warheads and missiles were removed from their silos. Destruction of the Minuteman II silos, as covered by the treaty, took place over the next several years with the last Minuteman II silo destroyed at the end of 1997.

Unilateral early deactivation of strategic forces scheduled for elimination under START II has been suggested by some arms control advocates.[3] Early deactivation of forces would work against obtaining ratification of the treaty because Russia would achieve U.S. reductions without having to undertake its own obligations under the treaty such as de-MIRVing Russian ICBMs.

Deactivated forces probably could not be regenerated. Some deactivated systems or important components of those systems may be destroyed. Many of these components were manufactured years ago and cannot be rebuilt without a significant and expensive effort. Operational considerations are also of concern for deactivated forces. Manpower with the proper training will no longer be available. Once forces are deactivated, there will be no budget or justification to maintain the capability for regeneration.

The Dangers of De-Alerting

Although there is no clear evidence that there are deficiencies in U.S. and Russian early warning capabilities or in their controls over nuclear weapons, some nuclear abolitionists contend that nuclear weapons should be taken off of alert not only as a safety measure, but as a next step in arms control. De-alerting would make the nuclear weapons virtually unusable, which would reduce the likelihood of accidental or unauthorized use, and would minimize or eliminate their effectiveness as a deterrent.

There are two false assumptions that underlie the thinking of some proponents of de-alerting. One is the assumption that nuclear weapons can be abolished and that the absence of nuclear weapons can be verified. The other is that the arms control process is hopelessly mired and cannot achieve further meaningful reductions in nuclear weapons. Neither of these assumptions is accurate, but they will not be examined here. See Appendices A and B for a discussion of the points that abolition is infeasible at present and the arms control process remains active. The remainder of this article will focus on the reasons why de-alerting is dangerous for security and stability.

De-alerting measures generate instabilities by making a first strike more attractive to an aggressor. Because de-alerting reduces readiness in many cases, de-alerted forces that are not survivable make more inviting targets. The aggressor could attack and destroy his opponent's de-alerted forces before they could be regenerated. To successfully undertake such pre-emption, the aggressor could use clandestine weapons, weapons that should have been de-alerted but were not, or could regenerate quickly in a breakout scenario.

---

[3]For example, the majority of proposals made by Bruce Blair, Harold Feiveson, and Frank von Hippel in their article "Taking nuclear Weapons off Hair-Trigger Alert" (*Scientific American* November, 1997, pp. 74-81) are actually suggestions for early deactivation or unilateral reductions of weapons that could possibly be eliminated under a START III treaty.

The incentive for an opponent to make such a pre-emptive strike would be particularly pronounced in times of tension, when an opponent might fear that U.S. regeneration may occur. In reality, the United States, knowing that its own regeneration of forces might be destabilizing, will likely hesitate to re-alert. As Senator Bob Smith (NH) has opined,

> "The very act of restoring de-alerted forces to higher alert status would be viewed as provocative and destabilizing. Thus, de-alerting should be considered a permanent act of disarmament; and, we should not expect de-alerted forces to ever again deter aggression at any level."

If indeed the United States did hesitate to regenerate its de-alerted forces during a crisis, it could undermine the nuclear deterrent and make a pre-emptive strike more attractive.

De-alerting could also lead to a destabilizing "regeneration-of-arms race." Nations would work to streamline the re-alert process because they would be worried about whether their adversary's forces can be regenerated more quickly and effectively than their own. In turn, this could lead to cutting corners with safety and security procedures, and could create or escalate tensions. It could even make the risk of nuclear war more likely because once the regeneration race begins, neither side would know whether the other was likely to stop at the brink. The incentive to initiate a first strike would be high.

A second, paradoxical problem is that, if one did not exercise to assure regeneration, deterrence and survivability would be decreased. The reason is obvious—the level of preparedness would be too low to regenerate swiftly and decisively in a crisis. Such operational practice would require extensive investment of resources. These resources may be vulnerable to budget cutting because they may not be perceived as necessary during a period of peace. To have an idea of the extent of the effort, imagine what would be required in the way of personnel, training, re-certification, basing, and especially cost to rearm B1B bombers with a nuclear capability and to place them on alert.

Third, de-alerting could adversely affect safety. Procedures to assure safety would need to be reassessed and perhaps redesigned. Also, the question of whether removal of warheads or parts affects the safety of the whole system must be addressed. Nuclear weapons systems are designed with extremely high standards for safety within specified parameters for operation. If those parameters are altered in any fashion, safety could be compromised. Certification for systems whose parts are separately stored could require expensive, time-consuming evaluation and may even require redesign.

Fourth, security also could be compromised by some de-alerting measures. Having warheads separate from the missiles could make them more vulnerable to theft or

sabotage while in storage or being moved during exercises or re-alert. Additional costs may be required to extend security. Also, in crises requiring rapid regeneration, efforts to make weapons operable quickly, in absence of having had extensive training and exercises in regeneration, could lead to errors resulting either in an accident or a situation in which the regenerated systems do not work properly.

A fifth problem is that most proposed de-alerting measures are either unverifiable or only verifiable with low confidence. Efforts to verify some of the measures would not only be extraordinarily expensive, they would entail full-time presence of inspectors or observers. In a time of crisis or tension, these people would likely be viewed as "enemy agents" and their access would be curtailed. In turn, this would probably escalate the crisis.

Sixth, de-alerting—particularly proposals that constitute unilaterial reductions—would circumvent the arms control process. This is, of course, what some advocates want because they believe that disarmament is not moving quickly in the post-Cold War era. For example, some advocates have suggested that START III is likely to eliminate four more U.S. submarines and reduce the number of warheads on each missile to four. They argue that these steps should be taken immediately. Such steps are dangerous because they are unilateral actions that affect force structure. Washington and Moscow should continue mutually verifiable arms reduction measures in a negotiated manner that involves an extensive, thorough review of the impact of any changes in their nuclear deterrents.

Below is a brief assessment of some of the problems associated with the de-alerting measures most commonly mentioned by proponents.

- Remove and store warheads

Removing warheads from ballistic missiles and storing them separately—de-mating—assures that no timely use of the missiles is possible. Regeneration—replacing warheads on their ballistic missiles—would be observable and would take at least as long to complete as the downloading required. However, operational procedures could be designed for clandestine regeneration, which could allow for pre-emptive first-strike preparation. The motivation for a potential enemy to undertake clandestine preparation would be enhanced by the fact that U.S. warheads would likely be clustered in a limited number of storage locations, making them high-value targets for pre-emption. In such a situation, an enemy could conceivably cripple the US retaliatory capability using only a few weapons.

Verifying the presence of removed warheads in storage would require a complete chain-of-custody from the time they are removed from the missiles. It would be impossible, however, to assure that no duplicate warheads were available for uploading. Verifying that no warhead is secretly replaced on a missile would require continuous intrusive monitoring and, even then, cheating may be feasible.

Removing certain warhead types from ballistic missiles would present a difficult verification problem and probably would divulge classified information. Today, the number of re-entry vehicles (RVs) aboard missiles can be counted for verification purposes without physically showing the RVs. The objective of verification is to determine only whether the space on the post-boost vehicle is occupied or not by an object which is then counted as a warhead. The RV is covered and details about its shape and construction are kept secret to prevent revealing information about RV and warhead technology. The prospect of counting specific types of warheads or RVs is a highly contentious issue.

De-mating has an additional negative implication for SLBMs. Putting ballistic missile submarines to sea without warheads on the missiles or without missiles at all removes the one great advantage submarines have over other weapon systems and why the U.S. depends on that leg of the triad more than on any other—the ability to survive and respond to a first strike. An SSBN that surfaces or comes to port is no longer stealthy; it can be readily located and destroyed. Furthermore, if it were to rely on a shore facility or a supply ship to provide warheads, those would have to survive an attack as well in order to be able to load warheads onto the submarine for a retaliatory mission.

Safety and security are also adversely affected by de-mating. Warheads are smaller, easier targets for theft or sabotage when separated from their missiles. If warheads were dispersed in many storage facilities to make them less inviting targets, the task of protecting them would be extraordinarily demanding compared to the security required for either warheads on missiles, or warheads in few storage areas. The Russians, in fact, have opposed removal of warheads as a de-alerting scheme because of these problems and the extra costs that would be incurred.

The financial cost of de-mating would be high, not only because warhead storage areas would need to be constructed, but also because there would necessarily be significant investment in new procedures, logistics for downloading and uploading, and operational training.

- Safing of missiles

Safing of ICBMs by installing switches in launch control centers, placing control switches on the missiles, or removing batteries from the missiles—all are measures that can be readily reversed within hours or overcome by the existence of possible backup systems not known to the other side. Survivability of silo-based ICBMs is adversely affected in the case of a sudden first strike, which therefore increases the value of pre-emption.

Safety switches and battery removal for SLBMs creates other problems. Would these components be kept on-board the submarine where they could be easily re-installed? If so, the launch of SLBMs would be insignificantly delayed. If the switches were not

on board, the submarines would no longer be survivable, as they would have to surface or come to port to retrieve the enabling devices.

An additional concern associated with safing is that the reliability of missiles may be affected from measures that start and stop power. Upon restarting power, the missile might not work properly. The problem is akin to a lightbulb or appliances; failure comes when you start them up, not when at a steadily powered state.

Verification of safing would be virtually impossible, even if highly intrusive, constant surveillance was allowed.

- Disabling the removal of silo covers

Proposals on affecting silo covers vary, but the general idea is to make it necessary to use heavy equipment to allow the covers to open. Defeating such measures and opening the silos quickly would be easy. Every option presented in the literature on de-alerting—such as placing heavy objects on silo lids or disabling the hydraulic opening mechanism—could be circumvented by a host of measures, the most simple of which could be directed explosives. Attempts to verify most immobilization options would be low-cost, but not effective.

If a way could be found to make disablement work, the principal downside would be the effect on survivability. Silo disablement would make quick launch of U.S. ICBMs impossible in event of sudden first strike by the opponent's submarine or bomber forces.

- Keep submarines on modified alert

Keeping the submarine force on modified alert—at sea, but not ready to fire missiles—delays the capability to retaliate in event of a nuclear strike. As discussed above, this could undermine deterrence by opening the possibility that the opponent could cripple U.S. decision-making with a first strike. But, it would also would require a complete redesign of the highly complex U.S. C^3 system and how it is implemented. The C^3 system is designed to support a force that is on alert; procedures and practices are based on this. Any change would require development of new measures to assure that the national command authority would be able to provide timely instructions to the submarine force.

Safety may also be adversely affected by remaining on modified alert because operators will not routinely practice going to alert. They will be more prone to mistakes. Verifiability of this measure is nil.

- Remove launch codes from submarines

Removal of launch codes from submarines would lengthen the time that it takes for a submarine to receive and act upon a launch command. Very-low and extra-low

frequency communication systems work at a low rate of data flow. A long period of time might be necessary to enable the transmission of all of the necessary information to launch the missiles. If only a single launch order is received and it is unexpected, there also will be substantial delay while the launch order is verified as authoritative. If C^3 systems were weakened and the flow of information slowed, as they are likely to be if there is a first strike, SSBNs may have to make themselves more vulnerable to attack by coming closer to the surface and deploying communication equipment, thus increasing vulnerability. The uncertainty of the survivability of C^3 systems coupled with dependency upon those systems for a launch code will dramatically diminish the capability of submarines to retaliate with certainty.

- Removing targeting information from missiles

If targeting or other critical information is removed from missiles, the time it takes to launch would increase. However, if that information is stored in close proximity to the missiles or their launch control centers the condition can be reversed in minutes or less as it is with the current policy of open ocean targeting. Therefore, such a move would add very little to the delays already built into the system. On the other hand, if the information is stored far from the missile complex then deterrence would be diminished because the return of this information could be interrupted or prevented, rendering the missiles useless. This option would not be verifiable.

In summary, de-alerting measures are likely to make a pre-emptive strike more attractive to an opponent. They also de-stabilize by creating a premium on being ready to regenerate—a process by which nuclear-armed nations would develop and practice procedures to quickly reverse de-alerting. Such efforts would also compromise safety by making nuclear weapons physically more vulnerable during regeneration exercises. Some de-alerting steps such as placing warheads away from their delivery systems in clustered storage areas would also diminish safety. Verification of de-alerting measures thus far proposed would be extremely difficult, if not impossible, and they would undermine the cautious, thorough arms control negotiation process.

Alternatives to De-alerting

If indeed a Russian C^3 problem exists, or if we want to assume that there is danger in absence of sufficient evidence to the contrary, there must be a better way to address the concern than undertaking steps that would be detrimental to U.S. security. Military-to-military exchanges at operational facilities have already begun with both high- and mid-level military officers, and can be expanded to increase their frequency as well as the number and type of personnel involved. Information exchanged could include, for example, notification of satellite launches.

Divulging certain aspects of command and control architecture can have a stabilizing effect, especially in crisis escalation, without giving away vital secrets. Information exchanged could include procedures for control, doctrine, and technologies, and related issues. Communications between Russian and American strategic forces could also be enhanced by installation of a "hot line" between top-level military commanders at key C^3 sites. The objective would be to increase confidence in one another's C^3 and to reduce the likelihood of mistakes without divulging critical command and control information. Sudden changes to a system that has maintained an effective deterrent for over 50 years should be avoided.

The measures to enhance understanding of C^3 may be in conjunction with increasing transparency regarding stockpiles. It must be kept in mind, however, that no means currently exist to verify the declarations of weapons numbers or materials quantities.

The exchange of somewhat sensitive information such as the movement of certain weapon systems (e.g., strategic bombers, mobile missiles, or submarines) could be extended from current requirements under existing treaties. This information may include base changes, patrol notifications, weapon storage location changes, and exercise notification. The timing and extent of the information exchanged would be such that there would be minimum impact on survivability. These actions would build confidence and would reduce the threat associated with a potential first strike. They would also be verifiable and could be reversed, if necessary, without significantly degrading stability.

Throughout all this, existing deployed weapons must be maintained in an alert state—constantly expecting a bolt-out-of-the-blue. In this manner, strategic nuclear forces can continue to provide deterrence and stability in crisis.

Conclusion

The principal reasons that the United States continues to rely on nuclear weapons for its security are that nuclear weapons threats remain, the nuclear genie cannot be put back into the bottle, and there currently is no technology that would allow the United States to verify that a potential adversary eliminated its nuclear threat. Additionally, the proliferation of chemical and biological weapons, coupled with the technical impossibility of verifying the presence or absence of such weapons, has created a new menace against which the U.S. deterrent applies.

Some arms control advocates have proposed that the United States lead the way to nuclear reductions by de-alerting its nuclear forces—lengthening the time required to launch strategic missiles or bombers. These proposals are prompted by frustration with the perceived slow pace of arms control, fear that degraded Russian C^3 could lead to a mistaken nuclear launch, and a desire to make nuclear weapons less usable and therefore less likely to be kept as a deterrent. Most of the measures advocated by

"de-alerting" proponents are mischaracterized; they are actually unilateral disarmament and/or deactivation measures.

The arms control process is slow because it is deliberate and careful; it should not be replaced by hasty unilateral actions based on the hope of reciprocation. The fears that Russian C^3 are insufficient are being addressed through bilateral contacts between the Russian and U.S. militaries. This process should continue. Using de-alerting as a means of reducing the reliability and usability of the U.S. nuclear deterrent is placing the cart before the horse. Until and unless a decision is made to cease relying on nuclear weapons for the security of the United States, no steps to undermine the deterrent should be taken.

There are a host of problems associated with de-alerting, including, increased incentive for pre-emption, lack of verifiability, increased instability during crises, and incentives for a "regeneration race." Most importantly, de-alerting diminishes the effectiveness of the nuclear deterrent by reducing survivability.

Appendix A:
Deterrence Policy and the Triad

Deterrence is the act of dissuading potential aggressors by convincing them that you have both the will and the capability to retaliate with consequences that they view as unacceptable. If an aggressor perceives that it can incapacitate you before you retaliate, deterrence is undermined. Thus, the reason that nuclear forces must be on alert is to assure that they are survivable so that pre-emption cannot occur and deterrence is maximized.

Both the United States and Russia depend on a mix of nuclear delivery capabilities, a triad—bombers, land-based intercontinental ballistic missiles (ICBMs), and submarine-launched ballistic missiles (SLBMs)—to provide deterrence. Having three very different modes of delivery complicates an adversary's attack and defense planning, making it less likely that aggression will succeed in disabling retaliatory capability. Each leg of the triad offers capabilities which complement one another, and which offer varying degrees of readiness and survivability.

Bombers

Bombers provide flexibility. They can be used in a conventional mode as well as nuclear, and can be re-loaded. They can carry a variety of nuclear bombs and air-launched cruise missiles, both low-yield and high-yield, and have the ability to stand off from their targets. Modern bombers are significantly stealthier than older models. Bombers are also stabilizing in that they are recallable, giving decision-makers added time to decide whether an attack should be executed. Without bombers, the United States would possess only ballistic missiles, which may be less effective in the future, as foreign ballistic missile defenses improve.

In the case of the United States, strategic bombers have undergone significant changes in their alert status since 1962, when about one-half of the U.S. strategic bomber force, numbering more than 1500 bombers and the several hundred tankers necessary to refuel them, were on constant ground alert ready with crews and weapons for immediate takeoff. These bombers were dispersed among a large number of bases, complicating any potential attack and increasing the probability that more aircraft would be airborne before their bases were destroyed. During the 1960s, airborne alert was practiced regularly, and bombers were kept in the air at all times during a crisis.

Today, about one hundred nuclear-capable bombers make up this leg of the triad, and they are stationed at only a handful of bases. Their nuclear weapons are stored away from them and would require some time to retrieve and load onto an aircraft. Bombers that cannot be launched quickly are the least survivable leg of the triad. They are also an attractive target because of the exchange ratio; few enemy resources are required to eliminate them. Regeneration would be highly visible and thus

could be used to signal serious intent in a time of crisis, but could also exacerbate rising tensions.

Bombers are likely to be the weapon delivery system of choice to commit precision air strikes against rogue countries or groups that employ weapons of mass destruction (WMD), especially in the case of WMD attacks against U.S. forces. Such strikes could potentially include the use of a nuclear weapon. Cruise missiles or aircraft-delivered bombs provide a more certain target location capability and the accuracy in delivery necessary for such a serious action. These weapons also offer relatively lower yields, which may be necessary to keep collateral damage as small as possible. Use of platforms located in the region of conflict would also avoid confusion on the part of other major nuclear powers that would be more concerned for their own safety by a ballistic missile attack.[4] Because the United States no longer deploys nuclear-tipped SLCMs, the bomber is the obvious weapon system to carryout such missions.[5]

Intercontinental Ballistic Missiles (ICBMs)

ICBMs are a reliable, low-cost weapon with a high alert rate. They are effective because they can be launched quickly and are difficult to defend against. U.S. systems are extremely accurate and thus have a very high probability of kill.

Today the U.S. has 550 ICBMs—50 Peacekeepers and 500 Minuteman IIIs—able to deliver a total of 2000 MIRVed warheads. U.S. ICBMs not only complicate an enemy's attack planning, they also require substantial proportion of the enemy's forces to "neutralize." Without land-based missiles, there would be only a few targets—bomber bases, ports, and C^3 nodes—for the enemy to attack.

ICBMs are not highly survivable if they are not mobile. Although U.S. ICBMs are stored in hardened silos, they are not as survivable as SSBNs and generated bombers. The newly deployed SSX-27 (Topel M) Russian ICBM may be so accurate that only one would be required to eliminate one U.S. ICBM.

Russian ICBM silos are considered harder, less vulnerable targets than those of the United States. More importantly, a significant and growing fraction of Russia's ICBMs are mobile and therefore far less vulnerable to attack. Because the United States does not have mobile ICBMs, readiness of this leg of the U.S. triad is critical to its survival.

---

[4]Depending on the region, a case could be made for bombers flying from and returning to CONUS. Deployed in this manner would mean that nuclear weapons would not have to be forward deployed.

[5]With sufficient time to regenerate, SSNs with SLCM due to inherent stealth, time of station, and quicker response may be the weapon of choice and not the bomber.

Under a current agreement between Presidents Clinton and Yeltsin all ballistic missiles are not directed against potential enemy targets. This condition is not verifiable and can be reversed in a matter of minutes.

Nuclear-Powered Ballistic Missile Submarines (SSBNs)

The third leg of the U.S. triad, Trident SSBNs, is stealthy. It is the leg most likely to survive an attack and retain the capability to retaliate. For those SSBNs at sea to have the capability to retaliate, they must have the missiles, warheads, and other components necessary to undertake a retaliatory attack without the necessity of either coming to shore or being resupplied at sea.

Today the U.S. has 18 Trident submarines; eight older Trident I and ten Trident II. Each submarine is capable of launching 24 missiles with each missile able to deliver 8 warheads. The Trident I boats carry the older, less accurate, C4 missile. The Trident II boats carry the D5 missile. Four of the older Trident I boats will be retired under START II and four others will be converted to launch the D5.

Although the number of SSBNs at sea at any given time fluctuates, in general about two-thirds of the entire force is underway in various conditions of readiness. Some of those at sea are in a fully alert status—receiving continuous radio communications from their operational commanders, undetectable by friend or foe and within range of assigned targets. SSBNs operate through relatively stable patrol cycles lasting approximately 90 days. About two-thirds of this time is spent at sea; the remainder of the cycle is in homeport or engaged in some other activity. When in homeport they undergo crew changes, refurbishment, and general maintenance. Weapons that are on-board are also maintained with activities such as changing limited life components. Every several years each SSBN must undergo an overhaul, which may keep it from going to sea for a year or more. With an SSBN force for the U.S. under START II of 14 submarines, as few as eight (8) of them would be at sea at any given time with some moving to their patrol areas, some transiting back, and the remainder in their designated patrol areas. Those in port would be destroyed in a first strike.

Although the submarine leg of the triad is the most survivable, it also faces some risks. One is that SSBNs could be attacked in port, possibly in a manner which would make it impossible to identify the perpetrator therefore delaying or preventing a U.S. response. If SSBNs represented our entire strategic nuclear force, we would lose a large fraction of our capability to an attack from a small number—there are only two submarine bases—of weapons. A second risk is the potential for a significant breakthrough in anti-submarine warfare (ASW). Continuing rapid progress in computational capability combined with advances in sensor technology may lead to a breakthrough in non-acoustic ASW. It is important that we do not rely completely on SSBNs for our nuclear deterrent given even a remote possibility of catastrophic failure in submarine survivability. This enhances the importance of having additional modes of delivery as a back up to SSBNs.

All three legs of the triad have been determined to be essential to U.S. security in every assessment of nuclear forces conducted by the U.S. Government. Maintaining a robust triad of forces is the best way to meet the threat. Recently, following the end of the Cold War, the United States reviewed its nuclear deterrent in the so-called 1994 Nuclear Posture Review. The conclusion of that extensive assessment was that nuclear weapons remain a critical element in protecting America's vital interests and that the triad must be maintained. Specifically, the United States must maintain the assured retaliatory capability to inflict unacceptable damage against those assets a potential enemy values most.

In November 1997, Presidential Decision Directive 60 reinforced the 1994 conclusion, adding that nuclear deterrence is to be applied to all threats of weapons of mass destruction—the United States reserves the right to respond to CBW attacks with nuclear reprisal. On March 31, 1998, U.S. Department of Defense Assistant Secretary Ted Warner testified before the U.S. Congress regarding the Presidential Directive, making the following statement on nuclear deterrence:

> Nuclear weapons remain important as one of a range of responses available to deal with threats or use of weapons of mass destruction against U.S. interests, and as an important disincentive to nuclear, biological, and chemical proliferation. They also provide a hedge against the uncertain futures of potentially hostile nuclear powers, and serve as a means to uphold existing U.S. security commitments to our Allies.

The United States does not rely on launch on warning, although it preserves the option to do so. Instead, the United States relies on the survivability of its nuclear forces to provide assured retaliation.

Russian Deterrence Policy

Russia also has reviewed and revised its nuclear deterrent posture. Due to the expense of maintaining conventional forces, Russia's reliance on nuclear weapons has increased. In May 1997 Russia announced that it no longer would adhere to a nuclear no-first-use doctrine, and Russia's new National Security Concept, promulgated in December 1997, states that "Russia retains the right to use all available forces and means, including nuclear weapons, if armed aggression launched against it threatens the very existence of the Russian Federation as an independent, sovereign state."

Russia considers its land-based missiles the mainstay of its strategic nuclear forces and does not depend on SSBNs as much as the United States. Over the past few years, Russia's sea-based and strategic bomber nuclear forces have clearly diminished in size, with only a few submarines on patrol in the open ocean today. This condition will probably improve in the future as Russia reshapes its strategic

forces and new weapon systems, currently under development, come on-line. In contrast to the United States, Russia continues to modernize its nuclear forces; it is developing a new SSBN, land-based and sea-based ballistic missiles, and long-range cruise missiles.

Russia has focused on survivability of its land-based missiles. Current ICBMs are contained in super-hard silos—much harder than U.S. silos—and on mobile missile launchers, which are difficult if not impossible to target with certainty (as our experience in Desert Storm has shown). Russia is also continuing to spend a significant amount of money (equivalent to billions of U.S. dollars) on constructing deeply buried facilities, whose purpose appears to be survivability in nuclear war.

Appendix B:
Why Nuclear Abolition is Presently Infeasible

The United States and Russia both have declared that nuclear weapons will be central to preserving their national security for the foreseeable future. The key reason for the centrality of nuclear weapons to security is their extraordinary destructiveness (although low-yield warheads can be tailored to limit destructiveness and fallout), which makes them highly effective as deterrents to aggression. Because nuclear weapons are so powerful, the incentive to make sure that they are not used is strong. This caution, in turn, reduces the likelihood of conflicts escalating into full-scale war. Additionally, when comparing equal military effectiveness, nuclear weapons are, relative to conventional forces, less expensive to maintain and use. In evaluating whether to go to an all-conventional force, the United States and Russia have each concluded that the cost to produce, maintain, and exercise this necessarily larger force would be significantly greater than nuclear capabilities, assuming equal military capability is to be retained.

In addition to their effectiveness and relatively low cost, nuclear weapons are likely to remain in U.S. and Russian arsenals because verifying abolition is not feasible with current technology. The United States does not know how many nuclear weapons or warheads the Soviets built, nor the size of Russia's current stockpile. Similarly, Russia cannot be sure of the number possessed by the United States, despite the relatively more transparent nature of the U.S. nuclear weapons program.

If Russia were to hide some of its stockpile and declare a lesser number, there would be no way to detect or prove the discrepancy. There are no national technical means to locate hidden nuclear warheads. Discovery would depend on serendipity. The wide range of error possible in estimating Russian warhead inventories was highlighted in 1993, when Minatom director Viktor Mikhailov stated that the Russian arsenal peaked at 45,000 warheads in the mid 1980s—12,000 more than generally believed.

A large fraction of the Russian nuclear arsenal exists in the form of so-called tactical nuclear warheads. These warheads are comprised of bombs, short-range ballistic missile and cruise missile warheads, surface-to-air missile warheads, artillery shells, and land mines. These weapons are used for both offensive and defensive purposes. They are deliverable by land, airborne, and naval surface and subsurface forces.

Unilateral, non-binding statements made by first the U.S. and then the Soviet Union in 1991 announced the intention to eliminate a major portion of these forces. Russia retains, according to U.S. Intelligence Community assessments, some 17,000-22,000 weapons.[6] The U.S. does not deploy any tactical nuclear weapons for land-based forces or on naval surface ships and submarines. Most U.S. tactical nuclear

[6]General Eugene Habiger, Testimony before the Subcommittee on Strategic Forces, Committee on Armed Services, U.S. Senate, March 31, 1998.

weapons have been dismantled. Various statements made by high-level Russian government and military leaders have suggested that Russia has not yet lived up to the promises made in 1991. A principal reason that limits on numbers of tactical warheads have not been codified in a treaty is that they are unverifiable.

The problem of undeclared weapons stockpiles is complicated by the possibility that Russia claims to have been destroying thousands of nuclear warheads per year, starting after the Cold War. There is no way to know if these claims are true. Perhaps no weapons were dismantled or, perhaps, Russia did dismantle weapons, but manufactured new ones just as quickly, using either recycled or new special nuclear materials (SNM).

Detection is equally if not more problematic with undeclared SNM. Current technology does not allow us to know how much SNM the Soviet Union produced during the Cold War, or how much Russia has produced since. Even with anytime-anywhere inspections, it could be impossible to find materials not only because there is no way to pinpoint where to look, but also because materials could readily be transported secretly. The present situation for inspections in Iraq, in attempting to find missiles, underscores the difficulties involved.

Estimates of materials stockpiles could be based on plutonium or HEU production capability and operation records, but discrepancies would be difficult to resolve and uncertainties could be significant. For example, Russian plutonium production has been estimated to be 145 tons. A 20% error—25 tons—could correspond to primary fuel for as many as 5000 warheads.[7]

Estimates of fissile materials stockpiles may be further complicated by the usability of fissile materials other than HEU or plutonium in weapons. It is possible that Russia has produced, weaponized, and stockpiled these other materials.

Secret plutonium production reactors and reprocessing facilities can be constructed underground or in a mountainside, with emissions eliminated or significantly minimized, and with no observable features to attract attention. Uranium enrichment plants can be hidden even more easily. The ease of hiding varies with the type of technology used. A 20,000 kg-SWU per year centrifuge plant would fit within a typical factory building and would consume only 600 kW electrical power.[8] The power consumption of a plant using laser isotope separation would be a factor of three smaller. Laser as well as chemical isotope enrichment processes can also be used to separate plutonium-239 from reprocessed spent reactor fuel.

---

[7]Sidney Drell, et al, "Verification of Dismantlement of Nuclear Warheads and Controls on Nuclear Materials," JASON Study for the U.S. Department of Defense, The Mitre Corporation document JSR-92-331 January 12, 1993, p. 54.

[8]Sidney Drell, et al, p. 77

The International Atomic Energy Agency (IAEA), which is responsible for assuring the use of nuclear technology for peaceful purposes only, has acknowledged that there currently are no technical tools enabling detection of clandestine weapons activities when they take place at undeclared facilities. The IAEA has noted that the problems of finding hidden plutonium reprocessing are greatly complicated in countries where openly acknowledged reprocessing has already occurred. This conclusion is echoed in the JASON Report of 1993, which stated that a determined and highly disciplined evader could undertake clandestine production of weapons or special nuclear materials without being detected by national technical means. Only real world lapses of discipline would leave traces of sizable activity that would be detectable.[9]

In addition to the problems associated with verification, there is tremendous potential in Russia for a break out from agreements that substantially reduce numbers of nuclear weapons. This is due to the fact that there is significant asymmetry between U.S. and Russian nuclear materials and warhead production infrastructures. Russia has a large, functional infrastructure with extensive redundancies. It is maintaining this complex, despite high financial cost. For example, there are multiple plants in Russia—four of which are major plants the size of the U.S. Pantex facility—that can produce thousands of warheads per year, whereas the U.S. is downsizing its capacity to a few hundred warheads per year. This includes not only facilities for manufacturing fissile materials components and other weapons parts, but also facilities for final assembly. In short, Russia has a functioning capability that would allow it to rapidly reconstitute a nuclear force in a breakout scenario. It is widely believed that Russia will continue to maintain its capability to produce nuclear weapons. This is based on the belief that Russia's nuclear weapons have a shorter shelf life than those of the U.S. do and they need to be replaced more often. However, the downside of this accepting this belief is that it also provides Russia with the ability to produce more warheads than need replacement. Also, there is no reason to believe that Russian warhead manufacturing technology won't match U.S. capability in the future.

By comparison, the United States has no facilities or infrastructure to manufacture many key materials and components for weapons. For example, there presently is no U.S. facility for producing plutonium pits. The U.S. plan is to begin pit production at Los Alamos National Laboratory by 2003, but the capability will be only about 20 pits per year compared to the Russian capacity of thousands per year. The U.S. objective is to maintain the enduring stockpile, thus it will not have the capacity to undertake large-scale production should there be a Russian break out some years hence.

[9]Sidney Drell, et al, p. 4

Appendix C:
The Arms Control Context

The Strategic Arms Reduction Treaties between Russia and the United States provide an important backdrop for understanding the impetus for and implications of de-alerting. President's Bush and Yeltsin signed the START II Treaty in January 1993. This treaty would reduce deployed force levels from the roughly 7000-7500 strategic warheads for each side (6000 accountable) under START I to 3000-3500 strategic warheads.

START II bans the deployment of MIRVed ICBMs, a long-sought U.S. goal that reduces the destabilizing threat of pre-emptive attack. In particular, it eliminates the SS-18 "heavy" ICBM, the centerpiece of Soviet/Russian strategic forces. (That system was reduced by one-half, from 308 to 154 silos under START I.) Silos for decommissioned missiles must be destroyed, but up to 90 heavy (SS-18), silos may be specifically modified for single-warhead SS-25 missiles. Also, under START II, 105 MIRVed SS-19 ICBMs may be downloaded so that they can carry only one warhead and up to 100 bombers may be reoriented to conventional-only roles and not counted against START II limits.

There is an up-front cost incurred by both sides to meet treaty requirements for modifying and/or dismantling existing systems. However, there will be a significant cost savings in future years from operating and maintaining fewer strategic systems. It has been estimated that the cost savings for the U.S. would amount to nearly $5 billion over seven years.[10]

The United States ratified START II in January 1996, but the Russian Duma has yet to approve the treaty, despite its advantages for Russia. For example, it fully counts all strategic bomber weapons, and therefore, eliminates an asymmetric, from Russia's point of view, "discount" afforded U.S. bombers by earlier agreements. It also provides, for the first time, a cap of 1750 on the centerpiece of U.S. strategic forces, SLBM warheads, less than one-half the number that could be deployed under START I.

Without START II, Russia will face either unilateral reductions in its strategic forces or a large investment to upgrade systems that have reached the end of their operational life spans. Such an upgrade would probably involve construction of costly missile production facilities to replace those that were located in Ukraine.

Conservative members of the Russian Duma point out several disadvantages to Russia under START II. One issue is cost. Russia will incur additional costs for modification and/or dismantlement of existing systems. In particular, silos must be

[10]Secretary of Defense William Perry in a speech to the Russian Duma in October 1996.

modified and there is a perceived need to build several hundred additional single warhead land-based missiles (SSX-27s).

Another perceived disadvantage of the treaty to Russia is that ICBMs will comprise only about 30% of Russian strategic forces. Historically, Russia has had about 60% of its strategic warheads on ICBMs. By contrast, the U.S. will still have about 50% of its warheads aboard the centerpiece of its strategic forces, SSBNs.

Another issue to Russia is the perception that the United States has an advantage in potential rapid reconstitution of larger numbers of missile and bomber warheads. START II allows the U.S. to download existing ICBM and SLBM systems and convert its fleet of 95 B-1 bombers to a conventional role without having to remove nuclear-weapons-launch capabilities. Therefore, it is conceivable that the U.S. could rapidly and economically reconstitute these forces, whereas the Russians would not have quite the same capability, having built missiles to carry only single warheads.

One option, rejected by the United States, is to satisfy Russian concerns by negotiating and ratifying START III without Russia's having ratified START II. The United States did agree, however, to outline START III. In Helsinki, Finland, on March 21, 1997, Presidents Clinton and Yeltsin signed an agreement whose principal points are listed in Table 1.

•Table 1: Key Components of 1997 Helsinki Agreement

- Enter into negotiations, once START II enters into force, for a START III Treaty that would reduce strategic warheads by 1000 below START II levels.
- Extend the deadline for reaching START II levels for deployed warheads by five years to December 31, 2007.
- Include four basic components:
  - limit, by the end of 2007, deployed strategic nuclear warheads to 2000 to 2500
  - incorporate measures relating to the transparency of strategic nuclear warhead inventories as well as the destruction of nuclear warheads (START III would, for the first time, require the destruction of warheads in addition to delivery vehicles.)
  - convert current START agreements to unlimited duration
  - deactivate by December 31, 2003 all strategic nuclear delivery vehicles to be eliminated under START II.

Proponents of de-alerting argue that the difficulties in negotiating and achieving ratification of START treaties could be circumvented by unilateral steps to remove nuclear weapons delivery systems from alert status. Some also argue that de-alerting would rectify what they and the Russians perceive as a numerical inequality of strategic forces in favor of the United States. Further, some contend, rightly, that de-alerting is effectively "something close to abolition" because of the financial, operational, and political difficulties associated with regeneration.[11]

Circumventing the negotiation process would be dangerous because the thoughtful give-and-take process, which yields approximate parity, would be lost. Verification would no longer play an essential role, thus setting the stage for mistrust and the possibility of a "break out." Also, the likelihood that Russia would actually fulfill any political commitment to de-alerting is questionable, at best.

Evidence from history indicates that Russia may agree to follow a U.S. de-alerting initiative, but will not actually do so. When President Bush ordered unilateral nuclear initiatives in 1991, the United States undertook a wide array of steps to reduce the size and alert status of its deterrent. To date Russia has not fully reciprocated. Some of the moves the Russians made were dictated by the break-up of the Soviet Union. Weapon system production facilities located outside of Russia were closed. Nuclear weapons and their delivery systems based outside of Russia were brought back or destroyed. Mobile missiles were moved back to garrison. Production of Bear-H and Blackjack bombers was terminated. Some tactical weapons were removed from land-based and Naval Units. But, there is no indication that these units were decreased to the levels announced by Gorbachev.[12]

[11]These arguments are made by Bruce Blair, in Testimony before the Subcommittee on Strategic Forces, Committee on Armed Services, U.S. Senate, March 31, 1998.

[12]"Gorbachev's Remarks on Nuclear Arms Cuts," *The New York Times*, 6 October 1991.