Naval War College Review

Volume 42
Number 3 *Summer*

Article 7

1989

Strategic Nuclear Planning After START

Douglas J. Hanson

Strategic Nuclear Planning After START

Ensign Douglas J. Hanson, U.S. Navy

Discussion of American-Soviet relations in recent months has focused increasingly on arms control. The Intermediate-range Nuclear Forces (INF) agreement, for example, has been heralded as a milestone in superpower cooperation and has paved the way for extensive reductions in strategic nuclear weapons. Such reductions are politically popular and the Strategic Arms Reduction Talks (START) negotiations have received a great deal of attention in the press. The implications of such reductions, which have not been adequately addressed, are highly important and require greater attention than we have given them, especially from strategic planners.

Arms control agreements will heighten restraints on strategic planners in the future. For example, a strategic arms reduction treaty will necessitate approximately 50 percent cuts in the strategic nuclear arsenals of the United States and the U.S.S.R. Such an agreement would limit the size of our strategic nuclear arsenal but would not change the goal of deterrence, creating more difficult challenges for American nuclear force planners.

Obviously, a strategic arms reduction agreement would have a significant impact on the status of the U.S. nuclear triad. Not only would the triad have to be appreciably reduced, but it would also have to be redesigned to maximize its effectiveness with regard to U.S. nuclear doctrine. Additionally, it would have to fulfill the requirements of the relevant treaties. This would not be an easy task and would require careful advance planning. For this reason we cannot wait until a treaty is on the books to develop the plans to fulfill its requirements. Such planning must begin today.

START Provisions

Throughout the ongoing Strategic Arms Reduction Talks with the Soviet Union, the United States has sought an agreement "leading to deep,

Ensign Hanson, a distinguished graduate of the U.S. Naval Academy, received his B.S. degree in political science in 1987 and an M.A. in political science from Syracuse University in 1988. He is a graduate of Naval Nuclear Power School and currently assigned to Nuclear Power Training Unit, Idaho Falls, Idaho.

equitable, and effectively verifiable reductions in the number of strategic nuclear arms held by both sides."[1] The Soviet Union, under the leadership of General Secretary Gorbachev, has been receptive to three American START overtures. In fact, at the Reykjavik summit in October 1986, President Reagan and General Secretary Gorbachev agreed to a series of general START provisions. The tentative agreement would limit each side to 6,000 warheads deployed on 1,600 strategic nuclear delivery vehicles (SNDVs), including ICBMs, SLBMs, and heavy bombers. Subsequent negotiations in Washington and Geneva have led to further agreements. Ballistic missile (ICBM and SLBM) warheads, for example, would be limited to a quantity of 4,900, while heavy ICBM warheads would have a ceiling of 1,540 warheads.[2] The Trident II D-5 SLBM, furthermore, would be counted as carrying eight warheads, and air-launched cruise missiles (ALCMs) would be counted at a fixed, though as yet undetermined, rate per ALCM-equipped heavy bomber. Finally, agreement in principle was obtained regarding nuclear-armed sea-launched cruise missiles (SLCMs). These weapons, with range greater than 600 kilometers, would be limited separately from the 6,000-warhead START ceiling.[3]

Details of other developments have yet to be either completed or released. Certain assumptions can and must be made, however, regarding logical treaty outcomes in order to assess its impact and plan accordingly, but in general, many of the provisions of the SALT II agreement will be retained. Warhead counts, for example, which were determined by SALT II, for various U.S. and Soviet SNDVs, will be retained as well as the practice of excluding forward-based systems such as carrier aircraft and FB-111s from the strategic force totals. These forces, however, would continue to supplement our strategic forces. Assumptions such as these will facilitate force planning efforts without the benefit of complete treaty details.

The provisions listed above provide extremely important guidelines for the post-START triad, but additional information is required to successfully plan for a nuclear force structure that will continue to deter the Soviets. First, we need a set of mission fulfillment criteria based on U.S. nuclear doctrine. Additionally, an assessment of current capabilities must be available to determine the degree of change necessary in the triad and the systems available for future allocation. These three sets of information—START provisions, mission fulfillment criteria, and current capabilities—will provide the necessary framework for our future planning efforts.

Mission Fulfillment Criteria

U.S. nuclear strategy is guided by the policy of flexible response. Developed in the 1960s, flexible response calls for the U.S. National Command Authority (NCA), normally the President, to retain sufficient

nuclear forces and control of those forces, even in the event of a Soviet first strike, to respond to any extent necessary to counter any degree of Soviet aggression. In other words, U.S. forces "are designed to maximize the uncertainties that a Soviet attack planner would face, and to confront the Soviet leadership with an unfavorable outcome in *any* contingency in which they may contemplate the use of nuclear weapons against the United States or its allies."[4] Maintaining a credible deterrent force and the possibility of rapid war termination at a low level of escalation are the primary goals.

Flexible response in this case does not mean merely the escalation of a European conflict between Nato and the Warsaw Pact to global nuclear exchanges as some critics have suggested. It is a broader policy that allows for several U.S. nuclear response options, depending on the nature of the aggression against the United States. For example, in the case of a very limited Soviet nuclear strike against the U.S. mainland, the NCA would have the option to launch a similar retaliatory strike and would not be limited to a "massive retaliation or nothing" decision. In the event of a massive first strike, moreover, the NCA could order just such a massive retaliation. In the latter case, a situation of mutually assured destruction (MAD) would exist, providing the most credible deterrent to a Soviet first strike against the United States.

During the Reagan administration this policy was generally interpreted as a counterforce targeting scheme,[5] but flexible response does not preclude countervalue as well. Whether it employs a counterforce or a countervalue targeting scheme, or a combination thereof, flexible response is the best possible nuclear doctrine for the United States now and in the post-START world. By providing the NCA with a broad selection of response options, this doctrine makes deterrence credible in a wide variety of circumstances. Flexible response, however, requires nuclear forces with unique qualifications. These qualifications, or mission fulfillment criteria, include survivability, responsiveness, and lethality, among others.

Survivability. The most important criteria is survivability. Enough U.S. strategic nuclear forces must be able to survive a Soviet preemptive nuclear strike to ensure retaliation and cause accompanying enemy losses such that the Soviet leadership would judge the costs of the first strike to be much greater than the benefits. This criteria also includes the ability to successfully penetrate Soviet defenses. Command, control and communications (C^3) assets must also be survivable.

Responsiveness. Strategic forces must be responsive to NCA release orders, should be able to reach their targets expeditiously, and must have the ability

to rapidly reprogram their guidance systems to respond to changing target scenarios. Responsiveness requires reliable C^3 assets and dependable systems. Responsiveness also entails endurance, which is the capability to maintain high alert rates for long periods of time, even during nuclear exchanges.

Lethality. Strategic forces must have a sufficient combination of accuracy and yield to destroy a wide variety of Soviet targets, both hard and soft.

Variety. Strategic forces should present a variety of unique targeting and defense complications to Soviet strategic planners to enhance survivability of U.S. forces, to prevent vulnerability arising from a catastrophic failure of a particular nuclear delivery system, and to maximize Soviet expenditure on non-threatening defensive systems.

Efficiency. Strategic forces should be cost-effective both in terms of procurement costs and operations and maintenance costs.

Finally, but by no means last in priority, safety is a prominent concern for any nuclear doctrine, not just flexible response. Risk of accidental or unauthorized launch of nuclear weapons must be minimized. Effective negative control features are required. Of course, a singular weapon system cannot satisfy all of these criteria completely. The complete triad, however, must fulfill as many of these as possible and obtain the best possible compromise, using a variety of nuclear systems to support the doctrine of flexible response.

Current Capabilities

As a final step before undertaking the reallocation process, it is necessary to assess the capabilities and magnitude of the current U.S. strategic nuclear arsenal. In this way we can establish to what degree revision of the triad is necessary to most effectively satisfy the criteria listed above, while simultaneously fulfilling the obligations of the START Treaty.

For purposes of discussion here, 1989 is considered "current," because this is the year in which the START Treaty is likely to be signed and ratified. It will be those forces in existence at the time of ratification that will be most relevant to our force planning efforts.

From the data presented in table 1, it is clear that not only is the current U.S. strategic triad well over the limits prescribed by the START Treaty, but it is also comprised largely of aged systems. In fact, over two-thirds of the warheads are deployed on launchers that are at least 15 years old, and many are much older than that. These older systems remain despite a major strategic modernization program initiated in 1981. It is also apparent that over half of the triad's launchers consist of silo-based ICBMs which

are vulnerable to modern Soviet ICBMs. These and other limitations of the current U.S. strategic nuclear triad will be addressed.

U.S. STRATEGIC NUCLEAR FORCES, 1989[1]

System	Year Deployed	Launchers	Warheads/ Launcher	Total Warheads
ICBM				
Minuteman II	1966	450	1	450
Minuteman III	1970	500	3	1500
Peacekeeper/MX	1986	50	10	500
Midgetman/SICBM	1994?	0	1	0
Total (ICBM)		**1000**		**2450**
		(52.4%)		**(17.7%)**
SLBM				
Poseidon C-3	1971		14	
Lafayette SSBN[2]		15x16[3]		3360
Trident I C-4	1979		8	
Lafayette SSBN[2]		12x16[3]		1536
Ohio SSBN		8x24[3]		1536
Trident II D-5	1989	0	8	0
Total (SLBM)		**624**		**6432**
		(32.7%)		**(46.5%)**
Total (ICBM+SLBM)		**1624**		**8882**
BOMBERS				
B-52G[4]	1958	98	20	1960
B-52H[4]	1961	96	20	1920
B-1B	1986			
ALCM		0	20	0
Non-ALCM		90	12	1080
ATB/B-2	1992?	0	12	0
Total (Bombers)		**284**		**4960**
		(14.9%)		**(35.8%)**
Total (ICBM+SLBM +Bombers)		**1908**		**13842**

Table 1

1 Deployed Systems. Excludes forces designated for testing and training.
2 Includes both *Lafayette* and *Franklin*-class SSBNs.
3 First number is quantity of submarines; second is quantity of SLBMs per submarine.
4 Equipped as ALCM carriers.

Sources: International Institute of Strategic Studies, *The Military Balance 1987-1988*, (London: IISS, 1987); U.S. Dept. of Defense, *Annual Report to the Congress, Fiscal Year 1989*, (Washington: U.S. Govt. Print. Off., 1988); Author's estimates.

The U.S. ICBM force is not only comprised predominantly of old missiles, but is highly vulnerable to Soviet ICBMs, especially the extremely accurate, high-payload SS-18. The bulk of the force is comprised of Minuteman II and III missiles which were first deployed in the late 1960s and early 1970s. Although they have been modernized to a large extent, they are not survivable against modern Soviet ICBMs and have only a limited hard-target capability. Additionally, their age brings into question their reliability. Problems have been located in the bonding of Minuteman solid-fuel systems, for example, as the missiles age.[6] Modern Peacekeeper missiles make up the remainder of the force. These systems are time-urgent hard-target capable but are vulnerable when deployed in their current configuration, which is in Minuteman silos. The warhead counts for all these systems do not exceed those set forth in the SALT II Treaty.

In the submarine leg of the triad, aged systems make up roughly half of the warheads, but 27 of the 35 submarines will have reached their design life expectancy of 20 years and the oldest of these *Lafayette* and *Franklin*-class boats will be 26 years old. These submarines currently have an expected service life of 30 years, therefore, many are nearing retirement.[7] Additionally, as they age, these SSBNs will wear out and require more repairs and down time. The other eight deployed submarines are of the *Ohio* class, which is larger, quieter, and more capable than the *Lafayette/Franklin* class. The *Ohio* and 12 of the *Lafayette/Franklin* class carry the Trident C-4 SLBM which has a longer range and greater accuracy than the Poseidon C-3 SLBM it replaces. The Poseidon, for example, has a range of approximately 2,500 nautical miles, while the C-4 has a range of approximately 4,000 nautical miles.[8] Age is the major factor affecting the submarine leg of the triad. Like ICBMs, warhead counts for the C-3 and C-4 were derived from SALT II provisions.

The bomber wing is the most antiquated of the triad legs. Over two-thirds of the aircraft are near or have exceeded 30 years of age. The B-52s, which are the backbone of the wing, are incapable of penetrating Soviet air defenses and are very expensive to maintain and fly. All these aircraft have been modernized and converted to carry ALCMs. Most, however, will have to be retired or assigned to a less-demanding conventional role in the 1990s as their offensive capabilities continue to be surpassed by enemy defenses. B-1Bs make up the rest of the bomber leg. These aircraft are far superior to the B-52 in terms of speed and penetration ability. They are currently fitted for a penetration bombing function.[9] Some early problems, such as fuel leaks and faulty ECM (electronic counter measures) arose during B-1 development, but these have been largely corrected and will be eliminated entirely as upgrading continues.[10]

The bomber wing is the most difficult leg to classify in terms of warhead and launcher strengths. The SALT II provisions help somewhat by setting

an ALCM limit of 20 per ALCM-equipped B-52 and B-1. This limit was utilized in table 1. SALT II, however, does not limit bombs. Therefore, non-ALCM aircraft are assumed to carry 12 bombs internally, which is the payload of the B-52. This is a very important assumption. START seeks to reduce warheads, not just launchers as in the SALT accords. Consequently, START must contain provisions for counting warheads on heavy bombers.[11] Additionally, forward-based systems such as the FB-111 and heavy bombers in the conventional role are not included in the strategic forces tables or START, but will continue to play a role in flexible response.

Currently, the U.S. triad meets the requirements for flexible response because of the large number of deployed warheads and Soviet inability to destroy American SSBNs. However, as American systems near their life expectancies and the Soviets deploy more capable nuclear forces, U.S. ability to carry out the doctrine will be reduced, especially in terms of survivability and lethality. START will compound this trend unless corrective action is taken.

Overall, it is clear that in a post-START world the United States must reduce the vulnerability of its strategic forces and reduce the total number of launchers and warheads in its arsenal. These two actions will be major themes guiding the transition to a post-START nuclear triad.

The SNAPS Plan

Assuming a START ratification date of late 1989 or early 1990 and a five-year transition period in which to comply with the provisions of the treaty, we require a realistic plan to transform the large, aged U.S. triad of the 1980s into a modern, highly effective strategic force by 1995. This plan, or SNAPS (Strategic Nuclear Arsenal, Post-START), will seek to optimize fulfillment of the mission criteria listed above with a combination of new and old systems, based on the constraints of available nuclear assets and procurement schedules. However, planning should not cease after START fulfillment in 1995. Consideration also should be given to longer range goals through the year 2000. SNAPS takes this into account. The resulting strategic force allocations for 1995 and 2000 are listed in tables 2 and 3, respectively. As illustrated, these force designs require significant changes in the three legs of the triad, each of which will be assessed.

ICBMs. The ICBM leg is both the most accurate and the most responsive of the triad due to extremely high alert rates and very reliable communications.[12] Unfortunately, in its current state it lacks survivability. Two methods exist for improving ICBM survivability, either hardening the silos or making the missiles mobile. The latter is preferred since, in the words

U.S. STRATEGIC NUCLEAR FORCES, 1995[1]

System	Year Deployed	Launchers	Warheads/ Launcher	Total Warheads
ICBM				
Minuteman II	1966	0	1	0
Minuteman III	1970	0	3	0
Peacekeeper/MX	1986	100	10	1000
Midgetman/SICBM	1994?	24	0	24
Total (ICBM)		**124**		**1024**
		(19.5%)		**(17.1%)**
SLBM				
Poseidon C-3	1971		14	
Lafayette SSBN[2]		0		0
Trident I C-4	1979		8	
Lafayette SSBN[2]		5x16[3]		640
Ohio SSBN		3x24[3]		576
Trident II D-5	1989		8	
Ohio SSBN[5]		10x24[3]		1920
Total (SLBM)		**392**		**3136**
		(61.6%)		**(52.3%)**
Total (ICBM+SLBM)		**516**		**4160**
BOMBERS				
B-52G[4]	1958	0	20	0
B-52H[4]	1961	0	20	0
B-1B	1986			
ALCM		50	20	1000
Non-ALCM		30	12	360
ATB/B-2	1992?	40	12	480
Total (Bombers)		**120**		**1840**
		(18.9%)		**(30.7%)**
Total (ICBM+SLBM +Bombers)		**636**		**6000**

Table 2

[1] Deployed Systems. Excludes forces designated for testing and training.
[2] Includes both *Lafayette* and *Franklin*-class SSBNs.
[3] First number is quantity of submarines; second is quantity of SLBMs per submarine.
[4] Equipped as ALCM carriers.
[5] Assumes continued production of one *Ohio* per year and refit of original eight beginning in 1991 and continuing until 1999.

of General Brent Scowcroft, "In the race between accuracy and hardening, eventually hardening has to lose.[13] To offset these weaknesses, SNAPS relies heavily on the prescriptions released in 1983 by the President's Commission on Strategic Forces (Scowcroft Commission). Briefly, the Commission recommended: that 100 Peacekeeper ICBMs be promptly deployed in

U.S. STRATEGIC NUCLEAR FORCES, 2000[1]

System	Year Deployed	Launchers	Warheads/ Launcher	Total Warheads
ICBM				
Minuteman II	1966	0	1	0
Minuteman III	1970	0	3	0
Peacekeeper/MX	1986	100	10	1000
Midgetman/SICBM	1994?	408	1	408
Total (ICBM)		**508**		**1408**
		(51.2%)		**(23.5%)**
SLBM				
Poseidon C-3	1971		14	
Lafayette SSBN[2]		0		0
Trident I C-4	1979		8	
Lafayette SSBN[2]		0		0
Ohio SSBN		0		0
Trident II D-5	1989		8	
Ohio SSBN[5]		16x24[3]		3072
Total (SLBM)		**384**		**3072**
		(38.7%)		**(51.2%)**
Total (ICBM+SLBM)		**892**		**4480**
BOMBERS				
B-52G[4]	1958	0	20	0
B-52H[4]	1961	0	20	0
B-1B	1986			
ALCM		40	20	800
Non-ALCM		0	12	0
ATB/B-2	1992?	60	12	720
Total (Bombers)		**100**		**1520**
		(10.1%)		**(25.3%)**
Total (ICBM+SLBM +Bombers)		**992**		**6000**

Table 3

1 Deployed Systems. Excludes forces designated for testing and training.
2 Includes both *Lafayette* and *Franklin*-class SSBNs.
3 First number is quantity of submarines; second is qnantity of SLBMs per submarine.
4 Equipped as ALCM carriers.
5 Assnmes eontinued production one *Ohio* per year and refit of original eight beginning in 1991 and continuing until 1999.

Minuteman silos; that a small, single warhead ICBM (SICBM) be developed and deployed; and that advanced ICBM basing technologies be explored.[14]

In the transition phase of SNAPS (1989-1995), Minuteman IIs and IIIs would be retired in favor of the Scowcroft-recommended Peacekeeper and Midgetman (SICBM) systems. The Peacekeeper is a modern, highly

accurate, ten-warhead missile. Moreover, it possesses the requisite accuracy and yield to destroy every type of hardened target.[15] The existing force of 50 Peacekeepers would be retained in fixed silos during the transition phase, while an additional 50 will be based in a rail-garrison mode. In this deployment system, small trains, each carrying two missiles, would be based at Air Force installations scattered throughout the country. During periods of increased international tension they would be dispersed on the U.S. railroad system.[16] The initial 50 would then be backfitted to a rail-mobile mode before the year 2000. Rail-garrison basing will dramatically increase both the survivability and endurance of the Peacekeeper missile system and the ICBM leg of the triad. It also will be relatively efficient, considering that the ICBM has been proven to be effective and 50 have already been procured. The Peacekeeper will be supplemented by the Midgetman.

To enhance survivability and variety in the ICBM leg, as well as continued modernization, SNAPS requires deployment of the Midgetman ICBM. With a hard-target capability, the single warhead missile will utilize the technological advantages of the Peacekeeper, yet will be small enough to be based in hardened mobile launchers. These launchers would be based on existing DoD and DoE (Department of Energy) installations and randomly moved throughout a designated deployment area. During crises this area would increase, and during attack dispersal the Midgetman could be deployed on the American highway system.[17] Besides survivability and accuracy, this system would also improve strategic stability. With only one warhead, it would "present a relatively low-value target and require a high exchange ratio from the attacker."[18] In fact, based on a 500-missile deployment, former Secretary of Defense Harold Brown estimated it would take "something like 3,000 1-megaton warheads to destroy it."[19] Under START, such an attack would require half of the Soviet strategic force to destroy about 400 warheads. Deterrence would obviously be enhanced with such a system. During transition, development and initial procurement of Midgetman would occur with deployment of 24 by 1995. A total of 408 would be deployed by the year 2000.

In the words of former Defense Secretary Caspar Weinberger, "A strong and modern triad must have a strong ICBM leg. And a strong ICBM leg must include 100 Peacekeepers."[20] With the addition of the Midgetman, the ICBM leg will be both survivable and hard-target capable well into the 21st century.

SLBMs. Strategic submarines and their SLBMs comprise the backbone of the U.S. triad. They are the most survivable of all U.S. nuclear systems and have the highest endurance. SLBMs, additionally, will attain a hard-target capability with the introduction of the Trident II D-5 missile at the end

of 1989. SNAPS retains an emphasis on SLBMs from the current triad configuration.

During the transition phase, the entire fleet of remaining Poseidon missile submarines will be rendered obsolete due to the age and limited capabilities of that particular missile system. A few of the older *Lafayette* and *Franklin* class, which carry the Trident C-4 missile, will be retained until replaced by D-5 capable *Ohio*-class submarines in the late 1990s. The remainder of the force will be made up of *Ohio*-class submarines carrying the C-4 and D-5 missiles.

New D-5 capable *Ohios* will be procured until approximately 1998, while the original eight C-4 versions will be backfitted to carry the D-5. Eventually, by 2000, the entire force will be made up of modern *Ohio*-class SSBNs equipped with the Trident II D-5 missile.

It is important to transition to the D-5 for several reasons. Although the C-4 SLBM is an extremely reliable, accurate, and long-range weapon, it lacks the combination of yield and accuracy to have a true hard-target capability. The D-5, on the other hand, will have twice the accuracy, twice the throw weight, and four times the warhead yield of the C-4, without sacrificing range.[21] This will give it the capability to destroy hardened Soviet targets.[22] In one configuration, the D-5 will also have greater range, providing greater effective patrolling area and enhanced survivability for our SSBNs. The D-5, moreover, by having a time-urgent hard-target capability, will have the ability to place the most valuable Soviet hardened targets at risk, even after a devastating first strike against U.S. land-based strategic forces. Knowledge of this capability and its damage potential should have an even greater deterrent effect on the Soviets than our present force structure, thereby contributing to strategic stability.

Efficiency also will be an asset of the SNAPS SLBM leg. Currently, the submarine leg contains nearly half of the triad's warheads, yet takes up only 25 percent of the DoD strategic budget.[23] This cost effectiveness should be at least equal if not greater under SNAPS. Additionally, nearly all of the *Ohio*-class submarines have already been authorized and funded, which will reduce SNAPS procurement costs.[24]

An important aspect of the plan would require increased readiness of the submarine force with at least 70 percent of SSBNs at sea, on average. To facilitate maximum alert rates, at least two additional SSBNs would be retained without missiles. An SSBN coming off patrol or going into refit could transfer its missiles to the reserve SSBN, which would then go on patrol. This would maximize underway time for our limited SLBMs during periodic SSBN maintenance and refit. Of course, careful verification procedures would have to be worked out to make this feasible.

Finally, communications should be addressed. A recurrent criticism of SSBNs, in fact the only one of major consequence, is that they are not responsive and that submarine C^3 assets are the most vulnerable to a first strike. These criticisms have some merit, but weaknesses in C^3 are a liability to the entire triad. ICBM and bomber communications are equally vulnerable to those with SSBNs.[25] Submarines on patrol also are equally if not more responsive to NCA launch orders than ICBMs or bombers. In the words of Rear Admiral W.J. Holland, a 32-year submarine veteran and past director of Strategic and Theater Nuclear Warfare in OPNAV, "The submarine begins to receive the [launch authorization] message before it arrives at the ICBM launch control centers."[26]

Most experts agree that American SSBNs are currently invulnerable and will remain so well into the next century. As a result of their stealth, and more than 40-million square miles of ocean in which to patrol, they are extremely survivable and have long endurance.[27] Incorporation of these capable systems, especially the D-5, into SNAPS assures the United States of the triad's maximum performance well past the year 2000. House Armed Services Committee Chairman Les Aspin (D-Wis.) summed up the system, saying, "Of all the strategic weapons systems we've looked at, we've given this one the highest marks."[28]

Bombers. Unlike ICBMs and SLBMs, bombers are recallable after launch and are reusable, assuming they survive Soviet defenses and have functional bases to return to. Furthermore, they are much more flexible in terms of their ability to selectively choose targets during a mission and the variety of weapons they can carry. For example, U.S. strategic bombers can currently deliver nuclear bombs, ALCMs, and defense suppression SRAMs (short-range attack missiles). Conversely, bombers are vulnerable to a preemptive strike if not on alert, have limited endurance, and lack time-urgent capability. They also are currently vulnerable to massive Soviet air defenses. The time urgency and endurance problems are currently insurmountable. Therefore, SNAPS will seek to reduce first-strike vulnerability and improve penetration capability.

During the SNAPS transition phase, all the remaining U.S. B-52 bombers will be either retired or transferred to the less demanding conventional role. In their places we will deploy a combination of the existing B-1B and the B-2 Advanced Technology (ATB) or "stealth" bombers. As the B-2 reaches IOC (initial operating capability), the B-1 fleet will be gradually converted to a primary ALCM role with a slightly reduced number of aircraft. This mix will continue through 2000, but in a slightly different ratio.

The B-1B is a significant improvement over the B-52. With one-100th the radar cross-section of the B-52, greater range, greater speed, and a much better low-altitude capability, the B-1 can not only outperform it, but has

a significantly improved penetration ability.[29] It also has a greater pre-launch survivability rate.[30] In the initial stages of SNAPS, the B-1 will be primarily a penetration bomber. As it is equipped with ALCMs, the B-1 will then perform a "shoot-penetrate" mission with ALCMs and bombs, and SRAMs will be deployed to knock out Soviet air defenses ahead of penetrating B-1s and B-2s. Finally, the follow-on SRAM II and advanced cruise missile (ACM) will be deployed when available, further increasing bomber capability.[31]

The B-2 is, as yet, largely a mystery in terms of capability, but its "stealth" features will give it an enhanced penetration ability. Payload is not yet known, so for evaluation purposes we assume that the B-2 can carry 12 nuclear bombs. SNAPS procurement of the B-2 will fall considerably short of the 132 currently planned by DoD.[32]

Like SSBNs, bombers must also maintain increased alert rates in the post-START world. Additionally, they should be dispersed to the maximum degree allowable by logistics constraints.

Bomber forces, finally, with their multiple weapons loads and their on-site targeting ability provide "the best potential for dealing with the growing threat posed by Soviet relocatable weapon systems."[33] This advantage is especially relevant considering Soviet deployment of their SS-24 and SS-25 mobile ICBMs.

Bombers, it can be seen, have several clear advantages. SNAPS would help optimize this important leg of the triad by making it more capable and survivable.

Warhead Allocation

SNAPS makes great qualitative improvements in each leg of the U.S. strategic nuclear triad in response to the quantitative limits imposed by START. This is not enough, however. A coherent plan must also maintain the capabilities of the entire force in addition to the individual legs. The force must be able to function as a system. For this reason, SNAPS allocates American strategic forces very carefully, based on mission criteria, cost, political considerations, and the principle of a triad.

The U.S. strategic arsenal need not be divided into a triad of air, sea and land systems. The forces could be concentrated into one branch, for example, or could be divided between two. For several important reasons, however, the triad has and will continue to prevail as the best overall arrangement of U.S. strategic forces. First, the triad complicates Soviet targeting and defense efforts by deploying an assortment of systems. This prevents concentration of Soviet resources and efforts on the defeat of any particular system. It also necessitates heavy Soviet spending on a complicated array

of defenses, including ASW, continental air defense, and BMD. These are resources which could otherwise be spent on offensive nuclear or conventional systems upgrades. The triad also prevents a system-wide technical malfunction from nullifying our entire deterrent force. The events surrounding the space shuttle *Challenger* disaster illustrate this type of possibility. Finally, the triad gives the President a great deal of options should deterrence fail.

Overall, SNAPS retains the general force mix which exists in the current triad (table 1). The backbone of the force is the submarine leg, which is allocated roughly 50 percent of U.S. strategic warheads at any one time. This mix ensures survivability and high endurance of the triad, without losing variety. Many experts, including Stansfield Turner and William W. Kaufmann, advocate a dramatic increase in the percentage of the triad allocated to submarines.[34] While this policy undoubtedly would increase survivability in the short term, it would also encourage Soviet ASW efforts. Moreover, it would create the possibility for the crippling of the triad if either a system-wide technical failure in SLBMs or a Soviet ASW breakthrough occurred. Finally, such a policy lacks political feasibility because it would receive neither Air Force nor Navy support.[35] A balanced 50-50 split between the Navy and Air Force optimizes interservice cooperation in this area.

Additionally, a balanced allocation is very cost-effective, since most of the SSBNs have already been procured or authorized. Allocating less than 50 percent to SSBNs would require more new ICBMs and bombers, which would be more costly in the long run. Also, SSBNs are very popular in Congress. In fact, the House of Representatives passed a resolution on 3 May 1988 which urged the Reagan administration to retain at least 20 Trident SSBNs after a START agreement.[36] This is slightly greater than SNAPS allows, but indicates a large amount of Congressional support for SSBNs.

The Air Force share of the triad, finally, would vary in composition as new systems were introduced. ICBM numbers, for example, would increase as they became more survivable. Overall, the SNAPS allocation of warheads between the triad legs ensures optimal survivability, variety, and efficiency of the strategic nuclear arsenal within the constraints of Pentagon and Congressional politics. Moreover, it actually encourages interservice cooperation and Congressional support by utilizing a wide variety of nuclear systems and military bases while maintaining an even balance between the Navy and Air Force. Political factors such as these comprise a vital component of strategic planning.

Vulnerability and Strategic Stability

A prevalent criticism of START is that it will increase the vulnerability

of the American triad to such a large degree that the Soviets will be tempted to launch a first strike. On the surface this would seem to be a logical assumption, especially if our vulnerable systems are retained. SNAPS, however, greatly reduces this likelihood by introducing significant numbers of survivable warheads.

Under the terms of START, both the United States and the U.S.S.R. will have 6,000 warheads and 1,600 launchers. Yet, in actuality, the United States would only have 636 launchers in 1995 and 992 launchers in 2000 under SNAPS. By casual inspection of table 2, one might easily conclude that 6,000 warheads could destroy these launchers in a first strike, especially considering their concentration at bomber and submarine bases. This conclusion, however, would not be justified.

For example, even assuming the worst case scenario in which the entire bomber and ICBM legs were completely destroyed and the submarine leg was 50 percent eliminated, the United States would still retain a retaliatory force of 1,568 warheads, enough to easily destroy the 200 largest cities in the U.S.S.R., the bulk of the Soviet oil industry, all Soviet submarine and strategic bomber bases, and many other military and industrial targets.[37] The retaliatory force would also be bolstered by U.S. forward-based nuclear systems, including several hundred nuclear SLCMs, and by the French and British nuclear forces. Overall, this retaliatory capability would present the Soviet leadership with an unacceptable amount of damage with respect to any gain they might achieve. By 2000, the situation would improve because of the full-scale deployment of our mobile and survivable ICBMs. Clearly, SNAPS would not provoke a first strike, but would deter it.

The other major criticism which might be forwarded is that an extensive time-urgent hard-target capability would decrease crisis stability by threatening all of the Soviet triad if the United States chose to launch a first strike. The logic goes that in a crisis the Soviet leadership, fearing an imminent attack, would launch a preemptive strike against the United States. However, the argument applied above is applicable in this case as well, except in the reverse order. Like the United States, the Soviet Union maintains a mixed force balance and it is deploying survivable nuclear forces such as the mobile SS-24 and SS-25 ICBMs, the Typhoon and Delta IV SSBNs, and the Blackjack intercontinental bomber.[38] These forces will give the U.S.S.R. a survivable retaliatory force. Both the Soviet and American leadership know this. They also know that no U.S. President would risk American civilian lives by launching a strategic first strike against the U.S.S.R. In short, reductions in the strategic nuclear arsenals of the superpowers will inevitably lead to qualitative improvements in existing forces. These improvements have been initiated already by the Soviet Union and will include survivability. The result will be greater, not reduced,

strategic stability if the United States follows through with its improvement programs. These programs make up an integral part of SNAPS.

The preceding pages have presented a plan for reconfiguring the U.S. nuclear arsenal to comply with the provisions of a START agreement. SNAPS, or Strategic Nuclear Arsenal Post-START, details the weapons, the allocations, and the time frame for deploying a practical, obtainable system that not only fulfills all the criteria necessary for flexible response and a secure deterrent force through the year 2000, but also is acceptable to Congress, the Navy and the Air Force. In this way, SNAPS serves as a vehicle for achieving significant force reductions without sacrificing our security.

SNAPS, however, is far more than a nuclear force blueprint based on rigid START guidelines. More importantly, it is a concept: a long-range planning model for strategic procurement and deployment. It is not the numbers that are of primary importance, for they will require periodic adjustment as a treaty is finalized, but the idea of a coherent, practical, and flexible strategy for strategic planning which is paramount. Such a strategy, based on an intelligent assessment of the relevant criteria and capabilities, will be useful primarily as a unifying point for the military services with regard to strategic planning and an instrument for presenting a coherent and consistent program before Congress. For SNAPS to be effective, however, several steps should be followed.

Begin Planning Efforts Now. The key decisions concerning the vital Peacekeeper and Midgetman systems are being made today in the Congress and the Administration. Because of long lead times necessary for the defense acquisition process, it is necessary to begin formulating and promoting SNAPS now.

Insist on Treaty Provisions Favorable to SNAPS. To facilitate incorporation of the SNAPS plan, military strategic planners and the JCS must present a list of requirements to the treaty negotiators. First, heavy bombers configured for the conventional role must not be included in the START totals. Second, provisions must be included which will allow deployment of standby SSBNs without missiles to facilitate heightened readiness. Finally, mobile ICBMs should not be banned.[39]

Obtain Unified Interservice Support. In each step of the planning process, especially in presentation to Congress, Navy and Air Force leaders must reach agreement. Compromise and cooperation are required. A uniformly supported program will stand a much higher chance of Congressional acceptance.

Promote the Concept Internally. Career military officers in DoD have much longer institutional longevity than Presidential appointees. To maintain continuity and long-term support, SNAPS should be promoted within the strategic planning subspecialties.

Seek Congressional Allies. Congress is the crucial body for defense procurement. Any successful program must have widespread Congressional support. Fortunately, with strategic systems Congress is generally supportive. According to Representative Les Aspin, "Congress has balked at almost no strategic major systems."[40] However, attitudes can change, so it is important to recruit support among our legislators. Congressmen and Senators also tend to have greater institutional longevity than Presidential administrations, making them all the more important as allies.

Seek Administration and Popular Support. Again, the greater the base of support, the greater the likelihood that Congress will pass the program.

Deemphasize Cost. Congress should be constantly reminded of the small percentage of the defense budget that strategic systems actually comprise, as well as the immense value the United States receives from this strategic investment—namely, avoidance of nuclear war.

Improve C^3 Assets. Finally, it is necessary to continue improvements in the C^3 system to limit its vulnerabilities and improve the deterrence capabilities of SNAPS.

An old adage says that it is dangerous to separate the planners of policy from those who carry it out. The SNAPS plan embraces this concept and places primary responsibility for strategic planning on military officers within DoD. Using START as a vehicle, we can create practical, flexible, and workable plans for procurement and deployment of our strategic nuclear arsenal, which will maintain a credible deterrent against Soviet attack while avoiding either a violation of treaty limitations or a retreat from our flexible response doctrine. By developing a military and Congressional consensus, we can minimize planning and procurement problems and pave the way for a stronger and more capable deterrent arsenal in the wake of START.

Notes

1. U.S. Dept. of Defense, *DoD Annual Report to the Congress, Fiscal Year 1989.* (Washington: U.S. Govt. Print. Off., 1987), p. 108.

2. *DoD Annual Report FY 89*, pp. 108-109; Heavy ICBMs are classified in the SALT II Treaty. For the United States these would include the MX, for the Soviet Union the SS-18. SALT II Agreement, Article II.7.

3. Leon V. Sigal, "START Nears the Finish Line." *Bulletin of Atomic Scientists*, April 1988, pp. 14-15.

4. *DoD Annual Report FY 89*, p. 53.

5. For a discussion of current American counterforce doctrine see: Bruce G. Blair, *Strategic Command and Control*, (Washington, D.C.: Brookings, 1985), chapters 2 and 7.

6. U.S. Congress, House, Committee on Armed Services, Arms Control and Disarmament Panel of Procurement and Subcommittee on Military Nuclear Systems, *Arms Control and Disarmament Activities*, Hearings, Testimony of Kenneth L. Adelman, Dir., U.S. Arms Control and Disarmament Agency and Rep. Richard Ray (D-Ga.) (Washington: U.S. Govt. Print. Off., March 1983-June 1984), p. 122.

7. Norman Polmar, *Ships and Aircraft of the U.S. Fleet*, (Annapolis, Md.: Naval Institute Press, 1984), pp. 47, 50.

8. *Ibid.*, pp. 442, 454.

9. U.S. Congress, House, Committee on Armed Services, Subcommittees on Research and Development, and Procurement and Military Nuclear Systems, National Defense Authorization Act for FY 1988/1989. *Review of the Air Force B-1B Program*, Hearings, Testimony of Lt. Gen. Bernard P. Randolph, Deputy Chief of Staff for Research, Development and Acquisition, Dept. of the Air Force (Washington: U.S. Govt. Print. Off., February-March 1987), p. 76.

10. *Ibid.*, pp. 77-79.

11. Since verification of individual bombers would be impractical, setting a fixed number of warheads per non-ALCM heavy bomber would provide a logical solution. Furthermore, if such a provision were not included and bombers were counted as one warhead, each side would have a compelling motive to violate the spirit of the agreement by procuring a large number of bombers. For example, 600 bombers would count as only 600 warheads, but could actually deliver 7,200 warheads (12 each). This number would increase to 13,200 in the event that 1,100 bombers were deployed. An additional 500 ballistic missiles carrying 4,900 warheads would be allowed under the treaty terms in this configuration. Obviously, failure to adopt a warhead-counting rule for bombers could dangerously undermine the spirit of START. Moreover, it would be especially dangerous for the United States, since we have a small continental air defense force.

12. U.S. Dept. of Defense, *Annual Report to the Congress, Fiscal Year 1988*, (Washington: U.S. Govt. Print. Off., 1987), p. 205.

13. U.S. Congress, House, Committee on Armed Services, Defense Policy Panel, *The MX Missile and the Strategic Defense Initiative—Their Implications on Arms Control Negotiations*, Hearings, Testimony of Gen. Brent Snowcroft, Former Advisor to the President for National Security Affairs (Washington: U.S. Govt. Print. Off., February-March, 1985), p. 64.

14. U.S. Congress, House, Committee on Armed Services, Hearings on *H.R. 4428, DoD Authorization Act for FY 1987*, Title I, Air Force Acquisition Statement FY 87, Hearings (Washington: U.S. Govt. Print. Off., February-May 1986), p. 706.

15. *Ibid.*, p. 707.

16. *DoD Annual Report FY 89*, p. 232.

17. *DoD Auth. for FY 87*, Title II, pp. 696-698. Prepared statement of Brigadier General Charles A. May, Deputy Director and Special Assistant for ICBM Modernization Directorate of Operational Requirements.

18. *DoD Auth. for FY 87*, Title I, Air Force Acquisition Statement FY 87, p. 710.

19. "The MX Missile and the Strategic Defense Initiative," Testimony of General Brent Scowcroft, p. 68.

20. *Ibid.*, p. 27. Quoted by Lieutenant General James A. Abrahamson, USAF, Director, Strategic Defense Initiative Organization of the Office of the Secretary of Defense.

21. *DoD Auth. for FY 87*, Title I, p. 943. Testimony of Admiral Kenneth C. Malley, USN, Director of Strategic Systems Project Office, Dept. of the Navy.

22. *Ibid.*

23. "Interview: Vice Admiral Bruce DeMars, U.S. Navy." Interview with Vice Admiral Bruce DeMars, Deputy Chief of Naval Operations for Submarine Warfare, U.S. Naval Institute *Proceedings*, Annapolis, Md.: October 1987, p. 55.

24. The 16th *Ohio* and 66 D-5 SLBMs were requested in the FY 89 DoD budget. The request has been approved by both the House and Senate Armed Services Committees without amendment. *DoD Annual Report FY 89*, p. 236; Tim Carrington, "House Panel Backs Defense Budget of $299.5 Billion," *Wall Street Journal*, 30 March 1988, p. 52; Tim Carrington, "Military Budget Wins Approval of Senate Panel," Wall Street Journal, 29 April 1988, p. 48.

25. For an extensive discussion of the vulnerabilities of U.S. C^3 assets see: Blair; and Aston B. Carter et al., *Managing Nuclear Operations*, (Washington, D.C.: Brookings, 1987).

26. Rear Admiral W.J. Holland, USN (Ret.), "The Link to the Boomers: The Triad's Best!" U.S. Naval Institute *Proceedings*, January 1988, p. 42; For a thorough discussion of the SSBN communications debate see: Holland; and Richard B. Kelley, "The Link to the Boomers: A Bad Connection," in *ibid.*

27. U.S. Congress, House Committee on Armed Services, Subcommittee on Seapower and Strategic and Critical Materials, Hearings on *H.R. 4428, Department of Defense Authorization of Appropriations for Fiscal Year 1987*, Hearings Testimony of Vice Admiral Bruce DeMars, Deputy Chief of Naval Operations for Submarine Warfare, Dept. of the Navy (Washington: U.S. Govt. Print. Off., February-June 1986), p. 77.

28. Tim Carrington, "Trident II Missile Wins Panel's Praise As Lone Success in U.S. Strategic Triad," *Wall Street Journal*, 28 March 1988, p. 24.

29. *Review of Air Force B-1B Program*, pp. 76-77. Testimony and prepared statement of Lieutenant General Bernard P. Randolph.

30. *DoD Auth. for FY 87*, Title I, p. 985. Testimony of Dr. Lawrence W. Woodruff, Deputy Under Secretary of Defense for Strategic and Theater Nuclear Forces.

31. *Ibid.*, p. 932. Prepared Statement of Dr. Woodruff.

32. *DoD Annual Report FY 89*, p. 238.

33. *The MX Missile and SDI*, p. 41. Prepared statement of General B.L. Davis, USAF, Commander in Chief, Strategic Air Command and Director, Strategic Target Planning.

34. William W. Kaufmann, *A Thoroughly Efficient Navy*, (Washington, D.C.: Brookings, 1987), pp. 22-24; Admiral Stansfield Turner, USN (Ret.), "Winnowing Our Warheads," *New York Times Magazine*, 27 March 1988, p. 69.

35. The Air Force would stand to lose a significant portion of its budget in this case since maintaining and operating strategic forces is a major Air Force mission. The Navy would also fear such a plan since a greater strategic function would likely divert resources from primary missions such as sea control and power projection. Any plan that would threaten the Maritime Strategy would not be popular among Navy leaders.

36. Associated Press Wire Service, 4 May 1988.

37. See Kaufmann, p. 28, for a list of hypothetical Soviet targets.

38. Tim Carrington, "Soviet Low-Flying Bombers and Missiles Raise Questions About Star Wars System," *Wall Street Journal*, 2 May 1988, p. 6.

39. Under the SALT II provisions, all B-52s and B-1s were counted as heavy bombers. START, however, will assign to each bomber a fixed allotment of warheads. If conventional bombers were included in the totals, the strategic airwing or the other legs would have to be reduced considerably. In the SSBN case, satisfactory verification procedures must be resolved that will allow for reserve SSBNs without raising fears of a breakout of the treaty in a crisis. Finally, the Reagan administration preference for a ban on mobile ICBMs should be modified. SNAPS depends heavily on these systems. According to Senator Sam Nunn (D-Ga.), "If we have no survivable mobile ICBMs to deploy under the START ceilings, then our options for taking advantage of the opportunities for stability afforded by this prospective treaty are greatly reduced." Senator Sam Nunn, "Arms Control in the Last Year of the Reagan Administration," *Arms Control Today*, March 1988, p. 4.

40. U.S. Congress, House, Committee on Armed Services, Defense Policy Panel, *U.S. Nuclear Forces and Arms Control Policy*, Hearings (Washington: U.S. Govt. Print. Off., May-June 1986), p. 8.