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SALT Superiority—Part II

SALT II and the Strategy of Inferiority

by Justin Galen and the *Journal* Staff

IN THE LAST ISSUE of the *Journal*, we began a two part series appraising the strategic balance and the draft SALT II agreement. This series advances the view that the US will enter an era of strategic inferiority in the 1980s, but that the SALT II agreement is desirable as a means of cushioning the initial transition to prolonged inferiority.

This view is based on eight main theses:

Thesis One: The USSR will overtake the US in strategic strength and capabilities during the 1980s, regardless of whether or not SALT II is passed.

Thesis Two: These trends in the balance, while sharply negative, will still leave the US with significant strategic strength.

Thesis Three: Although the USSR will not acquire anything approaching a war-winning capability before the mid-1980s, the USSR will gradually acquire vastly superior counterforce capabilities, and superior countervalue capabilities.

Thesis Four: Given what we know about Soviet economic behavior and the Soviet defense effort during the last decade, any reduction in Soviet spending on strategic forces resulting from SALT II will be used to enhance Soviet general purpose forces.

Thesis Five: The Soviets will progressively exploit their advantage with steadily growing success. The West must expect more and more Soviet challenges as Soviet strategic strength grows in the mid-1980s, and as it acquires enhanced blue water, intervention, and power projection capabilities.

Thesis Six: The domestic political factors that make the US unwilling to compete with the USSR for strategic parity and security are compounded by grave problems in DoD's efforts to develop a next generation of US strategic forces.

Thesis Seven: Regardless of its many defects, the US should accept SALT II. It represent the maximum Soviet concessions the US can hope for—indeed those concessions have been made only because the Soviets are more afraid of US willingness to compete than is realistically justified.

Thesis Eight: SALT II will at best offer a few short years of added security. It will not effectively limit the Soviet strategic build-up and the US will then have to negotiate progressively less favorable follow-on treaties.

The previous issue defended these theses in a comprehensive net assessment of the US and Soviet strategic balance. The concluding articles explain the arguments behind the thesis that the US force improvements planned in the FY 1980 defense budget cannot be executed; and the primary thesis—that SALT II is an acceptable agreement if the US must accept strategic inferiority.

In order to put this appraisal in perspective, former Deputy Secretary of Defense Robert Ellsworth (See p. 54) has been asked to provide his own appraisal of the trends in the balance, the SALT II agreement, and the willingness of the US to engage in effective strategic competition with the USSR. ■☆■

US FY80 Force Improvement Plans: Smell of Failure on SALT II Eve

TAKEN AT FACE VALUE, the Fiscal Year 1980 defense budget presents a long list of key improvements in US strategic forces. It implies that Secretary Brown was able to wring an impressive list of concessions from the Office of Management and Budget in a tight budget year, used every bit of the political leverage given him by the Administration's need to obtain political support for SALT II, and had strong personal support from the President in trying to check a growing Soviet strategic threat.

Such a budget would seem to indicate that Secretary Brown has achieved the limit of what US domestic politics will allow. In fact, even the Committee on the Present Danger estimates that a fully successful deployment of Trident II and M-X would largely correct the "counterforce gap" of the 1980s, assuming that the Soviets did not make major continuing improvements in their own force posture. This is illustrated in Table One, which also provides a good picture of the importance of the M-X and Trident II programs.

Unfortunately, however, Secretary Brown's achievement will probably only come to fruition on paper. In several critical cases, the improvements in US strategic forces listed in the FY80 budget are likely to be cancelled, stretched out, implemented only in part, or deployed in a less effective configuration. The "strong" strategic posture in the FY80 defense budget is, therefore, more image than reality. It is far better suited to selling SALT II than meeting the Soviet threat. ■☆■

The Party Line: Taking the FY80 Force Plans at Face Value

IT IS STILL INTERESTING, however, to analyze the Secretary's force plans, regardless of the probability they will be implemented. If nothing else, they set the bounds of what the Administration is trying to achieve, and describe its current thinking regarding what it must do to get Congressional support of SALT II.

Seen in this light, the most important aspect of the FY80 budget is that it asserts that the Administration will maintain and modernize each branch of the triad. It calls for improvement expenditures of well over $50-billion during the next decade, and is based on planned investment in force improvements of over $110-billion in FY80 dollars through the year 2000. This is reflected in the following force plans:

Commitment to the ICBM and M-X

The US will continue the modernization of the intercontinental ballistic missile force, and will develop the M-X:

- The US ICBM force will be composed of 550 Minuteman IIIs with three multiple independently targetable re-entry vehicles (MIRVs), 450 single warhead Minuteman IIs, and 54 single warhead Tital IIs. These 1054 ICBMs will carry 2154 warheads through 1985.
- The US will begin refitting 300 Minuteman IIIs with the Mark 12A re-entry vehicle and W 78 warhead to increase its accuracy and yield. This, in combination with the NS-20 guidance improvements already completed, will increase Minuteman III's accuracy from 400 to 200 yards, and its yield from 170 to 350 kilotons. This will increase its soft area coverage by about 50%, and double its single-shot kill probability against Soviet ICBMs from less than 0.4 to around 0.8. Coupled with other systems improvements, this will give the US roughly 900 warheads with comparatively high counterforce capability against improved Soviet silos. Some experts feel, however, that this upgrade will create new vulnerability problems since the Soviets will eventually learn precisely which silos have been upgraded, and could zero in on the three hundred targets which will be the only US systems which can be effectively employed in counterforce retaliation.
- The Minuteman Silo Upgrade Program now in progress will improve protection against electro-magnetic pulses, blast, shock, and radiation. Ongoing retargeting and communications improvements will continue including links to the improved Airborne Launch Control System.

This will equip 200 of the 550 Minuteman III missiles with an automatic link to the E-4 and EC-135 airborne system which will report on their survival status, and allow remote target data insertion into their warheads.

Combined with the NS-20 and the Mark 12A warhead will give these 200 Minuteman III at least some launch-under-attack capability and, more importantly, the range of technologies needed for flexible retaliatory counterforce and countervailing strategy targeting. The remaining 350 Minuteman IIIs will have a potential capability for similar data links, but no funding is planned.

Again, however, this presents the potential problem of narrowing the US ICBMs the Soviets must target from a total of 1054 silos to 200-300 key silos.

- The US continues to examine M-X basing options including Multiple Protective Structures (MPS), principally the use of multiple hardened vertical shelters or MAPs, a survivable air mobile system, or a mix of land and air launched basing. A ballistic missile defense adjunct is also being examined.
- M-X commonality will be sought with the Trident II. The exact nature of "commonality" has not been decided, and considerable controversy has emerged within DoD over whether commonality makes sense. The M-X is now being studied in 69", 83" and 92" diameter variants with lengths ranging from 50 to 60 feet, and weighs from 80,000 to 190,000 lbs. Only the 83" version would have commonality for two of three stages with the Trident C-5. It would be suited for relatively simple road movement, and still have potential air launch capability. It would carry 8-10 warheads, although eight seems increasingly more likely.

The 92" version would optimize the M-X as a heavy landbased ICBM, would have a gross weight of 190,000 lbs, and a throw-weight of 8,000 lbs., or half that of the SS-18. It could carry 10 to 14 precision guided re-entry vehicles (PGRVs), and up to twice that number of countervalue RVs. It represents the practical upper limit for transporter erector movement.

The 69" version would optimize it for air launch, but potentially cut RVs to six-eight. Both the 69" and 83" variant could probably only carry significantly fewer MaRVs and PGRVs. Some senior Navy and Air Force R&D officers feel OSD's projected savings for the 83" version are mythical, and will ultimately lead to higher redesign costs, and/or program delays as the M-X and Trident II are optimized to take advantage of their respective launch systems and to meet the changing mission needs of the late 1980s.

- The Advanced Ballistic Re-entry Systems (ABRES) program will seek to improve the immunity of US Re-entry Vehicles (RV) to weather effects on re-entry—which is now inferior to that of the fourth generation Soviet ICBMs—and to optimize the weight to yield ratio for a common M-X/Trident II warhead. It will develop options for advanced maneuvering re-entry vehicles (AMaRV) with preprogrammed evasion capability against Soviet ICBMs, and terminally guided RVs, known as PGRVs.

The AMaRV, and Navy M-K 500 Evader MaRV, would degrade accuracy back to the 0.25 nm level. However, the M-X PGRV would have a theoretical accuracy of better than .02 nm, and SSKP of over 95%, although even the 92" M-X might then only be able to carry a maximum of 6-8 warheads. The Trident II with the MaRV or Evader would be similarly inaccurate, but with the PGRVs it would have full counterforce capability, and provide only limited warning from launch stations nearest Soviet ICBM silos.

There are, however, no plans to move either program into engineering development, and the PGRV program would be essential to give the Trident II counterforce capability, and to allow the M-X to retain counterforce capability if the ABM evasion capability was added to its planned configuration.

- A final decision on the M-X design and basing is expected in spring or summer of 1979 (and can be timed neatly for maximum political impact on SALT). Full scale development funding is sought in a FY79 supplemental.

Plunging Ahead with Trident I and II

The FY80 budget similarly implies a strong commitment to modernizing the SLBM force without fully clarifying the level of capability the US will seek for Trident II:

- The US SSBN force now has 41 subs, 10 Polaris with 160 A-3 missiles, 27 have 432 Poseidon missiles, and 4 will carry 64 Trident I missiles. The Trident I subs will have four missiles each.
- The first Trident or Ohio-class SSBN submarine will be delivered in November 1980, with a planned IOC in late 1981, and one more submarine will be delivered each year in FY81-83, two more in FY84, and three every two years thereafter.

The Ohio class displaces nearly 19,000 tons, or more than a cruiser, and is 42 feet in beam and 560 feet long. It has 24 SLBM tubes vs. 16 for Poseidon and Polaris submarines. At sea availability is planned at 66% vs. 55% for Poseidon. Twelve Poseidon submarines will be refitted with Trident I, with the first deployment in October 1979. The Trident I sea-launched ballistic missile SLBM has a 4000 nm range vs. 2000 nm for Poseidon. This increases the launch submarine's patrol area from 2.5 to 40-million square miles.

The Trident I missile will have only eight warheads vs. ten for Poseidon, but its accuracy with stellar aided inertial guidance will be .25 nm vs. .3nm; its reliability about 15% better; its yield 100 kt vs. 40 kt; and its SSKP 0.12 vs. 0.07. The sub will also have much better silencing, and decoy capability.

• If Trident deploys on schedule, the 10 remaining Polaris SSBNs, dating back to the 1950s, with obsolescent A-3 MRV missiles, will be withdrawn. This will leave the entire Poseidon/Polaris force converted to Poseidon and Trident.

• Development of the Trident II missile will proceed. Reports differ as to its potential configuration. Some indicate it will differ from Trident I only in having 14 RVs, slightly improved yields, and a potential ABM evasion capability at the cost of less accuracy.

Other reports indicate that full PGRV option is being examined, and that Trident II has the following growth potential even without PGRV: (a) 6,000 nm + range and launch from base capability, (b) accuracy of 0.1 nm, (c) yields of 150-350 kt, (d) achievable SSKP against Soviet ICBMs of 0.3. Such a growth capability would approach an effective counterforce capability, and provide a major improvement in countervalue targeting flexibility.

• A "less expensive" SSBN is under study, and could impact on procurement as early as the FY82 budget. (Put in less veiled terms, this is the "Rickoverless" Trident. Many Navy experts feel a SSBN with a less ambitious reactor could be delivered at 50-66% of the cost of the Trident.)

Deploying the Cruise Missile While Searching for Its Carrier

The FY80 budget commits the US to the ALCM, but leaves the issue of the successor to the B-52 unresolved:

• SAC will conduct the largest alert exercise in its history—"Global Shield 79"—in an attempt to test and improve its uncertain ICBM and bomber readiness. This exercise will involve over 120,000 men, although some participants question its realism, and ability to spot real world readiness problems when the "test" involves so much rigidity and warning.

• The bomber force will continue to consist of 316 B-52s, 60 FB-111s, and 615 KC-135 tankers. The alert rate will be 25%, with surge capability, although there are increasing indications that the number of US bombers which are available with their full avionics complement on-line is far smaller than US force plans call for.

• The Cruise Missile will complete competitive flyoff, and survivability testing in 1979-80. Although it is encountering some minor development problems, the ALCM is scheduled to be deployed in a squadron of 16 B-52Gs in December 1982. The ALCM will have a W80 selectable yield warhead with a maximum 200 kt yield, and TERCOM (terrain contour matching) guidance with theoretical accuracies of 30 meters. Its delivery range will be over 2,500 km, including an allowance for maneuver.

• The B-52G ALCM upgrade program is encountering some configuration and design problems, but each will carry at least 12 ALCMs. An operational strength of 135 converted B-52Gs will be maintained, depending on the final SALT II ceilings.

• Each B-52G aircraft will be steadily improved through 1990 to try to ensure its penetration capability. The initial improvement program will provide an updated offensive avionics system, greatly improved electronic countermeasures capability, and limited improvements in resistence to nuclear effects. The B-52D will continue to rely on gravity bombs, and the B-52H and FB-111s on gravity bombs and the short range attack missile (SRAM).

• Work is proceeding on both the wide bodied Cruise Missile Carrier and variants of a "new manned bomber" including a supersonic bomber and subsonic low altitude penetrator. The 747, YC-14, C-5, L-1011, DC-10, and YC-15 are being examined as wide bodied options, as are the B-1 design, AMST, C-141 and C-5A.

However, last minute SALT II negotiations may have restricted all US ALCM carrying bombers to a maximum average load of 28 ALCM for new aircraft. This could make the subsonic manned bomber option more attractive than the wide bodied carrier.

• Work is proceeding on the Advanced Strategic Air-Launched Missile (ASALM) to replace the SRAM, and provide a possible technology base for an improved ALCM with supersonic dash capability.

• The KC-10A tanker is being procured, and work on up-engining the KC-135A continues. This could provide the improved tanker capacity necessary to support the B-52G with the ALCM, and to improve ride-out capability.

Freeing Strategic Systems From NATO Missions

• Development is proceeding on an extended range Pershing II (1,000 nm), on a new MRBM design, and on-land attack SLCM and GLCM concepts—all to be based in Europe. These are important because they could potentially eliminate the need to target Warsaw Pact targets with SLBMs and other US strategic forces, and free them to strike at strategic targets in the USSR.

• The US is proceeding with Patriot, which has a limited Anti-Tactical Ballistic Missile (ATBM) capability, and with NATO C³I improvements which can be transformed into a "launch under attack" capability.

Although of uncertain credibility, such improvements could help preserve the steadily weakening "coupling" of NATO and US strategic forces.

Little Progress in Strategic Defense, But Some Signs of Hope

There are some encouraging signs that the US will at least seek parity in some aspects of strategic defense technology, although DoD's FY80 plans do not call for a significant increase in the rate of modernization of US strategic defenses:

• Developmental work will continue on the ABM, and laser defense, ASATs, and non-nuclear ABM intercept, although without any significant increase in real funding.

• The most promising of these developments is the concept of deploying a small hypersonic ABM interceptor with the M-X. It would be significantly smaller than Sprint, be mobile with its own phased array radar, and intercept Soviet RVs below 50,000 feet. It would have inertial guidance and a nuclear warhead, and be able to move with the M-X missile if it were deployed in MAP or some other MPS variant. Such a development is, however, still in the conceptual phase.

Strategic posture in the FY80 defense budget is . . . more image than reality . . . far better suited to selling SALT II than meeting the Soviet threat.

• *Aviation Week* has also recently reported that the Army is considering non-nuclear designs with terminal homing, and that the Air Force is considering an airborne ballistic missile defense system to protect the air mobile M-X/B-52 and ALCM force with exoatmospheric terminal homing. All of these concepts are precluded by the ABM treaty, and it is unlikely any could be deployed before the late 1980s.

• The US strategic air defense system will continue to depend on six active Air Force F-106, and 10 National Guard F-101, F-106, and F-106 interceptor squadrons, for a total of 327 increasingly obsolescent fighters. 160 F-4s, F-15s, and F-14s will normally be available as augmentation forces.

• Three relatively obsolete Nike-Hercules batteries remain in Alaska, and four Nike batteries and eight Hawk batteries remain in Florida, although most may be phased out as part of the current wave of base closings. The vulnerability of these units to electronic warfare is high, and their low altitude coverage is very poor to nonexistent.

• The dedicated forces rely largely on F-106 fighters which, while upgraded, are now more than eighteen years old. Attrition has forced some of these units to replace their F-106 with F-4. However, one F-15 augmentation squadron has been assigned.

• The Air Force is also considering options to modernize these aircraft which include the F-14s Iran would resell to the US, dedicated F-15s, and improved F-15s with better radar and the Phoenix missile. Existing F-101s, F-106s, F-4s and F-15s are inadequate in radar power, radar and

missile range, low altitude kill capability, flight range and [illegible] US against Backfire and new Soviet heavy bombers with better ECM and ALCMs.

• Some major and urgently needed improvements are planned in US air defense netting and warning. A joint surveillance system (JSS) will be established to link 83 FAA and Air Force radars with seven regional operations control centers. These will replace the obsolete SAGE/BUIC system, and allow reprogramming of resources to support deployment of six AWACs aircraft.

• Work is still proceeding on an over-the-horizon backscatter radar warning systems for the East and West coasts, and the Southeast. This would extend warning from about 200-300 nm to roughly 1,000 nm. The E-3a AWACs warning and control system will replace the vulnerable DEW line system as the primary northern warning system, and study is underway for options to replace the now somewhat obsolescent DEW line radars with a mix of long range and automated short range radars that would provide at least some advanced landbased low altitude radar coverage of the Canadian-US northern approaches.

• DARPA is examining satellite air defense sensor systems, such as space borne phased array radars and/or multi-satellite distributed radars, to provide long range, low altitude, and cruise missile warning and air defense battle management capabilities. Even the fully upgraded JSS system will lack such capabilities, and there is little chance that OTH radar can provide them because of auroral and other regional energy problems. Such improvements are essential both to give warning to US bomber bases in the mid-1980s onwards, and to support any kind of cost-effective effort to improve US fighter defenses within reasonable aircraft numbers.

• DoD has begun a program to evaluate particle beam and high energy laser weapons. A Particle Beam Study Group, formed by Ruth M. Davis, Deputy Under Secretary for Research and Advanced Technology, has recently recommended a five-year feasibility research and development program, and the high energy laser program has been accelerated. Although the FY80 effort will still be relatively limited, DoD seems to be in the process of developing an effective long term program that could begin in FY81.

• The US seems to be developing an effective enough anti-satellite (ASAT) warfare program to give the Russians some incentive to negotiate an anti-satellite warfare treaty. The US now has a wide range of ASAT variants under study, ranging from the concept of satellite capture using the space shuttle, to a light aircraft launched homing missile which could strike at low orbit missiles.

The US could evidently test an initial ASAT weapon as early as FY81, and effective systems by FY83-84.

While the Soviets have conducted 16 [illegible] the USSR has demonstrated it can destroy US satellites while they are behind the earth's curve, the Soviet tests have generally been against low orbit satellites and have evidently relied on relatively simple attack technologies rather than more effective options like nonexplosive terminal homing warheads or high energy devices.

As a result, the current ASAT Treaty negotiations may lead to a US-Soviet agreement on an anti-satellite test moratorium in the next few months—the Soviets have not tested since 19 May 1978—and an effort to agree on a permanent ban treaty by 1981. The US has also added an evasion and warning system to some of its communications satellites, although it is unclear who is ahead in overall satellite evasion, sensor self protections, and electronics hardening technology.

An Uncertain Anti-SLBM/SLCM Capability

• The US will spend roughly $5-billion per year to try to preserve its massive lead in ASW capability, and ability to threaten the survivability of Soviet SLBMs and SLCMs. However, Soviet SLBMs are steadily acquiring a launch from base or protected waters capability. The SSN-8 with SLBM ranges of well over 4,200 nm was first deployed in 1978.

• There are also indications that the new Soviet SSBN, the "Typhoon," may have a titanium hull which may allow it to operate at depths which could seriously threaten the effectiveness of present and programmed US ASW forces. The Typhoon might also have the silencing capability to end the capability of the US "SOSUS" system to locate Soviet SSBNs within 55 square miles under optimal conditions.

Command, Control and Warning; Moving Towards "Launch Under Attack"

Although the US still has not declared plans to improve its overall strategic battle managements to the level necessary to implement a countervailing strategy under transattack conditions, it will sharply improve its capability to deal with the first major Soviet strikes against CONUS:

• The US will improve its tactical warning and attack assessment system in the north by giving BMEWS better reliability and ICBM attack assessment support. Two Pave Paws coastal phase array radars will replace six obsolescent FSS-7 SLBM warning radars, and provide more reliable warning and attack characterization against Soviet SLBM/SLCM attacks.

• The Integrated Operational Nuclear Detection System (IONDs) will be placed on NAVSTAR to provide world-wide nuclear trans and post-attack damage assessment data and help develop a launch-under-attack capability.

• The E-4 airborne command post aircraft will be upgraded with improved UHF, [illegible] ELF data links. EMP, secure voice, and anti-jam capabilities will be improved. Missile retargeting and status links are being added for 200 missiles. This new system, coupled to the E-4 and EC-135 and other sensors, will provide a limited defacto launch-under-attack capability, regardless of whether the US formally declares it will create such a capability.

• The first phase of the air force satellite communications system is partially operational, and expansion to include the DSCS is underway.

• The ELF communications program will be continued to try to improve the strategic submarine forces' ability to remain undetected for long periods during peacetime while still receiving communications.

The Navy argues that without ELF, the requirement for continuous communications reception could detract from their ability to remain undetected and their deterring effect since they would have to operate with antennas continuously at or near the surface of the ocean.

Recent congressional studies have seriously challenged the cost-effectiveness of ELF, however, on the grounds such vulnerability is too marginal to be important, and that ELF can at best make an exceedingly limited improvement in US communications. Such studies did not, however, examine the new targeting and battle management need of "countervailing strategy."

• Study is underway of the full range of space systems the US would need in the 1980s to ensure it had the battle management capability and survivability necessary to manage a strategic war which involved a sequence of major Soviet strikes and/or attacks on land based US strategic C³I systems. Although the details of such a system are not discussed in the FY80 DoD annual report, they could include such features as advanced shuttle-launched communications satellites, and a range of improved IR and radar warning sensors using mosaic focal plane technology.

A net assessment of US and Soviet battle management and strategic sensor capabilities is also being briefed in the Pentagon, and at least some study is being given to the present lack of survivable intelligence and nonstrategic war management systems, the lack of hardening of US land bases' command and control facilities, and the massive disparity between the USSR's 150-odd truly hard command and control sites and the few vulnerable US "hard" sites near Washington, DC, and at SAC headquarters.

However, the US will not be able to effectively manage any conflict in which the Soviets strike at a narrow number of its land based C³I sites or a conflict involving a sequence of high intensity strategic exchanges through 1985. The US decision in the 1960s not to harden its battle management system against thermonuclear weapons, and a somewhat

single-minded US focus on deterrence and assured destruction rather than battle management has effectively left the US equipped only to manage one all-out retaliatory strike. Until major improvements take place in US capabilities, many scenarios could occur in which even very selective Soviet attacks on the US national command authority could present the US with the agonizing option of having to strike blind or not at all. ■☆■

The Crumbling Keystones: Taking the FY80 Force Improvement Plans at Less than Face Value

THERE IS NO QUESTION that many of the detailed improvements in strategic forces which have just been outlined will occur more or less on schedule. However, the FY80 budget has three keystones: the M-X and improved ICBM basing, the upgrading of the SSBN force, and the deployment of the cruise missile.

Critical elements of each of these three keystones are in deep financial, political, and technical trouble. It now seems nearly certain that the US will not be able to implement of its FY80 plans without major slippage, massive budget supplementals, and the possible cancellation of at least one of the three key planned improvements in its delivery systems. ■☆■

The M-X and the Uncertain Future of the Triad

THE DEBATE over M-X basing which has surfaced in recent months has not been one over feasibility. If the issue had been one of finding a cost-effective means of correcting the performance limitations and basing vulnerabilities of Minuteman, the Carter Administration could have committed itself to the M-X and Multiple Protective Structure (MPS) basing in mid-1978. All of the basic technical problems were solved, and it seemed probable to most defense experts that the USSR would eventually accept one of several techniques the US could offer to allow the USSR to verify the number of M-X missiles deployed in an MPS basing pattern. Certainly, Secretary Brown was ready to make such a commitment, and at least informally proposed MPS basing to the President.

President Carter, however, has long taken a much more cautious view toward the expansion of US nuclear strength. One of his first concerns upon coming to office was to start an analysis of how small US forces could be and still provide deterrence. And, as his initial SALT II proposals to the Soviets demonstrated, he has set the goal of trying to significantly reduce the strategic forces on each side, rather than simply seek to maintain a stable balance of deterrence. These views interacted with the concern of several of his other senior advisors that the M-X and MPS presented too serious a risk for the SALT II negotiations, that MPS basing might lead to massive Soviet strikes against the US in war and serious environmental problems in peace, and that the deployment of the system might seriously erode the President's liberal and regional political support during the 1980 campaign.

As a result, the President did not accept the Secretary's recommendation, and after some intense exchanges, instructed the Secretary that (a) the Department of Defense should not publicly advocate MPS, and (b) should examine a wider range of basing concepts. These came to include such options as the air-launched M-X, a split between air-launched M-X and the use of Minuteman silos, added reliance on SSBNs, and mobile systems which did not require hard silo basing.

The M-X Basing Crisis

As a result, OSD and the Air Force have had to spend much of the last twelve months simultaneously trying to find alternatives to MPS basing and trying to change the President's mind. This has presented serious problems because there are no simple cost-effective alternatives to MPS. The MPS concept is comparatively easy to deploy. Unlike the sheltered tunnel concept, which proved to have uncertain survivability at any reasonable level of cost, MPS would rely on sheer silo numbers to make it impossible for the Soviets to launch an effective first strike against US ICBMs. There would be about 15 to 25 silos for every M-X—or about 4,000-5,000 aim points for a force of 200-260 M-X missile with 1,600 to 2,600 counterforce capable warheads—depending on which MPS basing concept is chosen. While it would take several years to build-up such a system, it could be done without any of the risks inherent in the other basing concepts, and would have relatively limited operations and maintenance costs.

These advantages of timeliness and cost have led virtually every DoD expert working on improved US ICBM basing to favor MPS over such alternatives as the use of aircraft to provide an airborne ride out and launch capability. However, OSD rigidly clamped down on any dissent with the Presidents's views after his guidance to Secretary Brown. went so far that Air Force Chief of Staff, General Lew Allen, got a personal reprimand from Deputy Under Secretary William Perry for testifying that MPS was a superior concept, and then had to go back and eat his words before the same committee.

At the very least, even a successful alternative to MPS means serious delays and additional risks. There are severe physical limits on how quickly the M-X can be reliably based unless it is initially deployed in something like the present Minuteman silos. All of the concepts which DoD was instructed to examine as substitutes for MPS were sufficiently uncertain, and involved such long lead times, that it is unlikely that large scale forces could have been deployed until well after 1987.

And this is so far in the future, that it is beyond the "prediction point" for what the Soviets can do to improve their future counterforce attack capabilities. If US attempts to reduce ICBM vulnerability lag into the late 1980s or 1990s, there is no way to be sure they will be effective or useful. Further, even under all the constraints of SALT II, the US could find itself in a high technology C³I, basing, and PGRV arms race which could end with only limited or no ultimate improvement in ICBM survivability unless the US spends vastly more than it now plans.

Airborne Presidential Basing Ideology

Such issues became all too clear as DoD evaluated the air launched M-X option which the President initially seems to have favored as the alternative to MPS. The precise configurations of the air launched M-X that the Air Force and OSD examin-

ed have not been made public, nor have the variants mixed air launched systems and land basing. However, various reports have indicated the principle alternatives came to be (a) a force of about 300-350 STOL aircraft like the YC-14 and YC-15, with 120-150 on alert, or (b) a smaller force of 150-175 higher payload aircraft the size of the 747 or C5A, but with STOL characteristics and requiring much higher alert and reliability rates. Both options required about 120 added support aircraft—including a substantial number of heavy tankers.

Complex trade-offs were evaluated between aircraft configuration and missile size and performance. There are indications, however, that all variants eventually required the equivalent of a new launch aircraft design, although the YC-14 and YC-15 might not have required total redesign.

Killing More Americans to Create an Inferior System

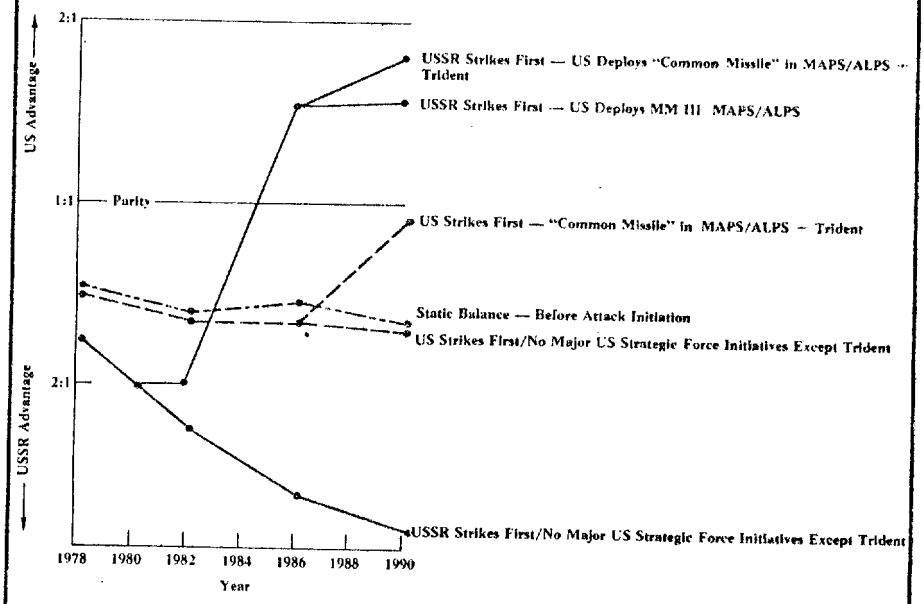
Various vulnerability studies in the Pentagon produced steadily more complex basing requirements, but the final variants evidently involved a mix of primary bases, and secondary and tertiary dispersal bases. The number and mix of these bases changed by week as the studies progressed, but *Aviation Week* reported that the final concepts called for five to eight main operating bases, 30-40 alert bases with two aircraft each, 100 primary dispersal bases, and several thousand secondary dispersal locations which could have included areas throughout the US and even non-airbase roads and landing sites. The cost of such new main operating bases would have been up to $200-million, and that of an alert base $18-22-million. These costs would have dropped drastically for co-location, however, and co-location with civil or military bases would have cut such costs below one tenth that of a new base.

Yet, the risk of Soviet SLBM and SLCM attacks, and various cost factors forced any primary and alert bases to be in an approximately 14 state area roughly 600 miles away from both coasts and the Gulf to provide 20 minutes of warning. This meant that short of building new airbases, dispersal sites had to be much nearer population centers than the MPS silos.

While recent reports indicate that the dispersal bases could have been chosen from over 4,000 airfields in this area, and that the M-X carrier could theoretically have operated from unimproved strips as short as 3,000 feet, and that the area might be expanded on the assumption the Soviets would not launch from the Gulf of Mexico, it is far from clear that an M-X launch aircraft and C³I system could have been developed with anything like this flexibility without systems costs and deployment times escalating far beyond those reported.

Accordingly, actual basing flexibility might have been far smaller than such plans indicated because a less flexible aircraft might have to be accepted.

Table One
The Critical Importance of US Force Improvement Plans in Closing the Counterforce Gap



Does Not Include Present BACKFIRE

Source: Committee on the Present Danger, Press Release, 9 March 1979.

It is also questionable that such systems could be deployed in a way that did not result in some predictability that would allow the Soviets to attack a finite number of US air bases, or to combine an attack or series of attacks on the launch aircraft bases, their support facilities, and their complex air control and warning systems.

Lt. General Tom Stafford, the Air Force Deputy Chief-of-Staff for R&D, noted in an interview in the *Omaha World Herald*, that some of the prompt casualty effects from such an attack could be avoided by deploying the launch aircraft in two's from airports 70 miles apart; 21 miles from cities over 25,000; and 3½ miles from towns under 25,000. However, given the fact that the environmental impact statement exempts basing near national monuments, national parks, certain historic sites and wildlife reserves—and that basing near B-52 and other military targets seems unacceptable—the target mix may ultimately not have been all that great.

There is also a complex mix of other factors which could have greatly increased the vulnerability of an airborne M-X force: (a) there are strong cost reasons to disperse as little as possible in peacetime and to maximize the load on main and alert bases, (b) basing could be further restricted by a host of state and local pressures, (c) the Soviets could use any ICBM or SLBM RV to hit such bases and not just their accurate ICBMs, (d) only single RVs would be needed for damage limiting, (e) both the bomber and M-X branches of the triad could be attacked simultaneously with no warning gap, (f) the Soviets could build-up their SLBM force to 14 RVs each under SALT II, and can build-up a tremendous counterforce capability, and (g) new satellite targeting and depressed trajectory SLBM technology could greatly improve such capability by the mid-1980s.

Ironically, while the M-X MPS sites would have been in unpopulated areas in the Great Basin of Utah, Nevada, and Arizona, the airborne M-X bases would have to be scattered throughout more populated areas in Montana, Wyoming, Colorado, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Wisconsin, Upper Michigan, and Illinois.

Accordingly, the end result of an airborne M-X may be that described by Lt. General Stafford in the same interview.

> "Every little town that has an airport is probably going to be a target. . . . [or the Soviets] could use an air barrage. They could explode a whole series of ICBMs in the air and cover the whole area."

In passing, it should be noted that such basing also made nonsense out of the environmental argument. Desirable as it might be to preserve sagebrush, coyotes and cacti, there is no question that the peacetime operations of such an airfleet would have had far worse environmental effects on people than MPS. There also was little question that a Soviet attack on the air launch M-X force would produce at least an order of magnitude greater long term death rate than an attack on the MPS silo complex.

Degraded M-X Accuracy and a Loss of Real-World Counterforce Capability

New warning and navigation systems would also be required for airborne launch, and serious questions existed about the real world accuracy and reliability that could be maintained over time under such conditions.

While some reports talked about worst case accuracies of 1,500-3,000 feet with inertial and stellar inertial options, it seems more likely that such systems would eventually have to use some form of PGRV, and very advanced and buffered data links.

Reading between the lines, this may be why Secretary Brown indicated the US may not need a countersilo capability in his discussion of "countervailing strategy."

There were other problems inherent in the size of an airborne M-X. The original baseline M-X option with a 92" diameter would have had twice the gross weight of Minuteman III, four times the payload, an initial 30-50% better accuracy, and high growth potential to PGRV/MaRV capability. It could probably launch the SALT II limit of 10 RVs even with PGRV capability, and if SALT II should fail, could launch up to 25 countervalue RVs.

In contrast, a 69" diameter, air-launch optimized M-X would have substantially less throw weight, PGRV upgrade, and payload fractionation flexibility than Minuteman. It might be able to launch only six PGRVs or less, and would have little growth potential.

Some senior Pentagon officials questioned whether even a 83" air-launched M-X would have the flexibility required to meet the needs of the 1980s. There was substantially broader concern that a 69" M-X could prove totally inadequate to adapt to the demand imposed by Soviet force improvements, and might seriously mortgage US capabilities to an inadequate system.

Pricing the M-X Out of Existence

Although the precise costs of the air launched M-X options are uncertain, it is also clear that the direct procurement costs would have been at least $29-40-billion versus $19-30-billion for the M-X in MPS. Similarly, the direct O&M costs for the air launched system would range from $700-1,100-million annually versus $400-500-million for the MPS based M-X. While these figures are anything but concrete, Pentagon officials privately agree that the direct life cycle costs of the air launched M-X would have been almost twice those of an MPS based force.

This alone could eventually have jeopardized procurement of the M-X in an era when the US will also have to cope with massive on-going cost escalation in the Trident program, but it is only part of the story. The air-launched system would also have involved far more technical risk, and far higher indirect support costs. The previous figures evidently made no allowance for the added tanker support aircraft, and indirect manpower costs of air-launched version, or for the increased marginal cost of larger numbers of pilots, crews, etc. in an air force which already has serious critical skill availability problems. They also evidently failed to allow for the complex marginal cost interaction of adding air launched M-X to an improved B-52G ALCM force.

The true cost of the air-launched variant might well have ultimately cost as much as four times that of the MPS variant if all these costs were considered, and the cost of overcoming added design risks was included.

This made the air-launched M-X an exceedingly "iffy" system, particularly if the political winds should later have shifted to make a "dyad" more acceptable. And, the resulting M-X hardly served as the paragon which land-based ICBM's were said to be in Brown's Annual Report. It was not a land-based leg of the triad.

Continuing Delay and Uncertainty in the M-X Program

The result seems to have been, that after several attempts to find workable variants of the air-launched M-X, the White House finally gave up on the option at a meeting during the first week of May. According to various reports, Dr. Brzezinski, Secretary Brown, and Deputy Secretary Warren Christopher attended a meeting at which each of the options was compared, and at which the air-launched option was rejected. The options which did survive as finalists were (a) a variant of the MPS proposal, and (b) placing the M-X in existing Minuteman silos while increasing the SSBN force.

It is unclear which MPS variant was selected. Some reports have indicated that it might still be the "shell game" option originally selected by Secretary Brown, with 250 M-X missiles moving by transporter between a large number of hard silos. Other reports indicate that it might be a variant transported by rail along special tracks, and which would place missiles in a softer and cheaper form of shelter that would protect against distant hits, but not offer the same security or associated accuracy and C^3 capability as a fixed silo. Such "soft" basing and rail transport would offer the advantage of fewer cumulative environmental effects, and significantly easier verifiability than vehicle transporters, but would also offer far less protection and flexibility in basing.

The SSBN variant seems to have been the "augmented dyad." This would mean standardizing on the Trident II missile, and deploying it in both SSBNs and the existing Minuteman silos. It would not, of course, solve the ICBM vulnerability problem, and it is uncertain whether it would result in a fully effective counterforce capability for even the land-based portion. As is discussed later, it is even more questionable that it would actually lead to any more SSBNs within the 1980s. At least some Administration advocates, however, evidently felt this was an advantage because it would give the US several more years in which to seek a permanent cap or reduction in total strategic systems, and avoid a commitment to the mobile ICBM. Some advocates of SALT III argue that this is essential and that if both sides deploy mobile ICBMs whose number can never be exactly established, future arms reductions may become impossible.

There is no question which of these two options virtually every DoD policy maker and military expert would chose: they back the "shell game." The uncertainty lies with the President. Some reports indicate he would personally like to choose the "augmented dyad," but that he realizes he would have to do so in the face of strong opposition from (a) virtually every senior military officer and defense official, (b) many key members of the Senate upon whom he must rely for ratification of the SALT II, and (c) many key members of the national security community whose opinion could be crucial in influencing the Senate. These factors would seem to outweigh his personal inclinations, but it is difficult to make any clear prediction of the outcome.

There is one thing which is clear, however, and that is that the M-X concept is still in very serious trouble. Even if the President does choose a given concept, and the Congress accepts—which is by no means certain—the resulting system must now slip at least several years. It seems exceedingly doubtful that an MPS-based force can now be fully deployed until after 1990. At best, the build-up during the mid-1980s will be far slower than that reported in Secretary Brown's FY80 force plans, and the situation could be much worse. If the "augmented dyad" is chosen, the US could end up with the same silo basing it has today, and no solution to ICBM vulnerability.

Summing Up the M-X Basing Crisis

This situation creates a serious crisis for US strategic planning:

- It leaves no firm basis for evaluating the SALT II agreement. The Congress can be expected to start its own basing evaluation once the President stops, and the ratification debate may have to proceed without being able to establish the future capability of US ICBM forces.
- It leaves the US without a clear strategy for improving its strategic forces. Regardless of the concepts Secretary Brown articulated in his FY1980 annual report, it is all too clear that the US remains undecided about the level of strength it needs, the need for the triad, the amount of counterforce capability it requires, and the desirability of given levels of post-attack survival. Further, given the incredible variations in missile and warhead numbers which are now possible, it would seem that both our targeting strategy and "countervailing strategy" capability remain equally

• The long shock of the basing struggle has done much to disrupt the Air Force management of the ICBM effort and US strategic planning, and has been demoralizing for all concerned. It was a major contributing factor in the resignation of Secretary of the Air Force, John C. Stetson, and has left many DoD officials and officers with the impression that a serious gap is growing between their perception of the Soviet threat and that of the White House.

• It creates real and serious uncertainties as to whether the M-X could be deployed before 1990, and as to what level of capability will ultimately be required. The IOC for the M-X will slip from a period in which the NS-20/MK-12A would lead warhead technology to one where PGRV and MaRV capability may be the rule. There is no way to predict whether the M-X will now be adequate once the force finally builds-up, what Soviet missile and missile basing capability will be, or what combinations of active and passive missile defense may then be necessary. It is equally involved in a complex race of improved targeting,. battle management, and C³I systems.

What is certain is that all the neat curves showing the future size of US and Soviet strategic forces, and the impact of M-X, are now promises which may never be kept. However desirable the trends in Table One may be, there is no assurance that such US force improvements will occur. ■☆■

A Blunted Trident

THE DEVELOPMENT OF TRIDENT I AND II already has become a horror story that makes the development of the C-5A look like a pardigm of good management. It has evolved from the relatively low cost 8,240 ton SSBN, and 6,500 nm SLBM that emerged from the "Strat X" study and ULMS proposal to a 18,700 ton submarine with a 4,000 nm missile. This cut in missile range alone assured a vastly reduced patrol range and area, and increased the risk of future ASW detectability within the smaller area.

In fact, Trident's evolution has been a model of unmanaged management by the Navy. The real cost of the lead ship has doubled in cost from a 1974 estimate of $800-million, although $1.5-billion is the latest official figure, follow-on ships could cost 3-4 times their initially programmed price. The total program cost for 14 submarines, planned at $12.4-billion in 1974, and now at $25.1-billion, is almost certain to really be $36-48-billion.

Trident annual deliveries have also slipped from an original 1-3-3-3 schedule for the 10 submarines (4 years), to 1-2-2-2-1 (6 years), to 1-2-1-1-2-1-2 (7 years), and now 1-1-1-1-2 for only 6 submarines. The initial deployment date has slipped from the late 1970s to the 1980s.

As a result, Polaris and Poseidon submarines must be expensively extended beyond their design life.

Not surprisingly, Secretary Brown—who was publicly embarrassed by the weakness of the Navy's senior managers of the Trident program in late 1977—has already committed DoD to trying to find lower cost alternatives in his FY80 posture statement.

More quietly, he is seeking to end the program after seven submarines and possibly after six. It is virtually certain, therefore, that (a) 14 Trident SSBNs will never be built and will be replaced by a cheaper and less capable submarine. (b) that the Trident program will be stretched out even further or terminated with fewer deliveries without a quick follow-on, or (c) that some other element of the Triad or Navy will have to be cut back to pay for the Trident.

In fact, such probabilities have sharply increased just as this issue goes to press. The Navy has just completed a six volume study in response to pressure from the Senate Armed Services Committee that indicates that a new SSBN could be built which would still have 24 missile tubes but save up to 30% of the cost of Trident by going to a smaller hull and different reactor. Other more radical and risk-filled concepts such as Jason, are also getting serious study, and senior Naval officers are quietly letting the press know they would like a different SSBN if Admiral Rickover's influence could somehow be overcome.

There are also rumors—which DoD has denied—that the Trident I missile will have to be deployed with serious questions still existing about its total system performance, and with some sacrifice of range below 4,000 nm and in reliability. However, Secretary Brown claims 14 successful launches out of 17, and it should probably be assumed for the time being that the Trident I missile program at least is successful. Reports also indicate that work (although it is slipping) is proceeding on the MK 500 "Evader" MaRV warhead for Trident I. Such a warhead will degrade the accuracy and reliability and lacks any PGRV upgrade capability.

What *is* certain is that the Trident II program has lagged badly, escalated in cost, and has now been sent back to the drawing board in the search for commonality with the M-X.

It is thus uncertain that Trident II will be available before 1990, or what its ultimate configuration may be. It is increasingly unlikely it can have performance even roughly equivalent to the level of accuracy now achieved by the MK-12A/NS-20 ICBMs before the early 1990s unless the US commits itself far more firmly to developing an SLBM with "surgical" accuracy than Administration plans now permit. This, coupled to other problems in the Navy's strategic C³ system, may mean the US will lack the option of upgrading the SLBM to help counter any failure to reduce the vulnerability of its ICBMs.

It also means that whatever happens to the Navy's present SSBN/SLBM program, there are exceptional risks in the recent pressures to replace the M-X by relying on an "augmented dyad" of Trident missiles in Minuteman silos and more SSBNs. This concept received a sharp push by some Administration officials when the 5 May White House meeting on the M-X made the impracticality of the air-launched M-X all too clear. It should be equally clear, however, that the risks of tying the nation's strategic future to a faltering SSBN program are even greater, and might well end in defeating success by reinforcing failure. The "augmented dyad" is a tidy concept from the view point of SALT II, but it could end in (a) a totally disorganized US force posture after the Protocol expires and just as the US is seeking SALT III, (b) a lack of any survivable US systems with prompt counterforce capability, (c) a serious destabilization of deterence in the mid-1980s and/or (d) an incredibly costly effort to somehow fix Trident by throwing enough money at it. ■☆■

The Cruise Missile:
Uncertain Delivery Platforms and Survivability for the Late 1990s

SOME DoD officials who have reviewed the present program for the initial deployment of the B-52G Cruise Missile carrier privately question whether the US will quickly deploy the increase in refueling tankerage such aircraft require, whether the cruise missile will achieve its planned reliability, and whether total systems costs can be properly controlled. However, such officials indicate these risks are limited, compared to the problems of the M-X and Trident, and that the possibility of a program cost escalation of 100% is an acceptable norm during this phase of cruise missile development.

Accordingly, it seems likely that the upgraded B-52G can be a successful cruise missile carrier at least through some period in the mid-1980s, and that the US will be able to deploy the planned cruise missile force of 135 aircraft at some point near the time that Secretary Brown has promised.

What is far from clear is that the US will produce the overall cruise missile force it needs. Serious problems do exist in the rideout survivability, force configuration, future carrier, and slow reaction time of this third keystone in the triad of the 1980s.

The uncertainties regarding the B-52G's survivability were discussed in the last issue. It is impossible at this point to estimate how serious they will become in the future, or how much they will be compounded if the President opts for an air launched M-X. It does seem likely, however, that even if Soviet strategic defenses do not improve to the point where they threaten the B-52G, the Soviets will steadily improve their ability to destroy the basing and infrastructure necessary for the B-52G to ride out successive exchanges.

This potential increase in vulnerability may be further complicated by the SALT II treaty. SALT II places no limits on missile range, performance, or speed, but does evidently limit heavy bombers in the number of missiles they can carry. The limit on new aircraft is an "average" of 28, and the limit on existing aircraft is 20.

This leaves the future of the wide body carrier, and future manned bomber, highly uncertain in a year when the USSR could roll out two new heavy bombers, and has been testing its own ALCM improvement on the Backfire. It also deprives the US of the option of using heavy individual aircraft ALCM loads to counter air base vulnerability.

The work on the next generation of US cruise missiles also seems to be facing very severe delays and lacks any clear conceptual direction.

Accordingly, the US faces an uncertain future with the ALCM. This is compounded by the problems in the future of the Navy's Tomahawk SLCM program, and the uncertainty as to whether the US will develop a peripheral attack option that could match the probably Soviet SSGN capabilities. The US will certainly pioneer the development of effective ALCMs, but it is far from clear it will produce the cruise missile force needed for the late 1980s.

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Uncertain Forces for a Strategy of Inferiority

IT IS DIFFICULT to predict how many of these problems in the three keystones of US strategic force improvement plan will turn into real crises. However, it now seems virtually certain that the US will not meet all its key FY80 force improvement goals, and will slip into strategic inferiority and SALT II with significantly less military capability than the Pentagon now projects.

These problems also have obvious implications for SALT II. The long term US bargaining position will be weaker than current Administration estimates imply, and US ability to compete with the USSR under "SALT I" or "no-SALT" conditions will be far more limited.

It is also clear that it would take vast increases in US expenditures on strategic forces to correct these problems, and that even then, serious management and conceptual problems would remain in our ability to deploy new strategic forces. It will take major—and now highly unlikely—changes in American politics and military leadership to overcome the reality behind the promises of the FY80 budget. ■☆■

SALT II: Accepting Strategic Impotence with Dignity and Style

ONCE ONE ACCEPTS THE PROSPECT of US strategic inferiority, SALT II takes on a different character. Its potential value consists of its short term ability to stabilize and limit the growth of Soviet strategic capabilties while the shift towards US strategic inferiority is still uncertain, and is still in its early stages. It can neither be condemned for enshrining an avoidable US inferiority, or be expected to provide the US with more than an ephemeral increase in security. SALT II must be judged as only the first step in a long series of SALT negotiations which the US will have to conduct under progressively less favorable conditions.

There also can be little hope that a revised SALT II agreement can be used to constrain the USSR—so that SALT II arrests the US shift towards inferiority—and even less hope that the US will somehow regain the will to compete directly with the USSR if SALT II is not passed. We must prepare to negotiate from the weakness we have bought, rather than try to bargain from the strength we might have purchased.

Similarly, it makes little sense to get involved in the theology of SALT II, given its reality. The most that advocates of strong US strategic forces can hope for is to pressure the Administration to adhere as closely as possible to the force goals in its FY80 budget, and to fine tune some of SALT II's individual provisions and protocols. There is no point in debating what might be, when the US is unwilling to pay the cost of competing with the USSR.

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The Nature of SALT II

IT IS, HOWEVER, well worth reviewing the provisions of the agreement reached on May 10 to see how they will impact on the balance in the early 1980s, and what kind of Soviet forces improvements might logically occur if the agreement is ratified. The broad structure of the more than 100 page SALT II agreement will consist of:

- A six year *treaty* to remain in force through December 31, 1985, unless replaced earlier by an agreement further limiting offensive strategic weapons.
- A *protocol*, an integral component of the Treaty, which would be of only three years duration, and whose expiration date would be December 31, 1981.
- A *Joint Statement of Principles* which would provide the basic guidelines of possible SALT II negotiations.

While a great deal of discussion has taken place regarding the *de jure* differences between the treaty, protocol, and joint statement of principles, the *de facto* differences are becoming increasingly blurred as (a) the delays in ratification diminish the importance of the difference in timing between the Treaty and protocol,

(b) it becomes clear the US will be unable to make the improvements prohibited in the protocol before 1985, (c) it becomes clear the Senate will only ratify the treaty if it "ratifies" the protocol and agreement, and (d) it becomes clear that the entire package is the de facto "negotiating precedent," and that the US cannot decouple one element of SALT II from another of its future dealings with the Soviets.

The "Unofficial" Provisions of the SALT II Agreement

The sensitivity of the Treaty negotiations has led the Administration to publicly disclose some provisions of the SALT II agreement while withholding others. However, various sources such as Secretary Brown, the SALT Panel of the House Armed Services Committee, and John Collins of the Congressional Research Service have provided a fairly complete list of the provisions of the treaty.

Probable Treaty Terms

- US and Soviet strategic nuclear delivery vehicles (SNDVs), consisting of ICBM launchers, SLBM launchers, heavy bombers, and air-to-surface ballistic missiles (ASBMs) will not exceed an aggregate number of 2,400 within six months of the time both nations enter into the treaty.
- The SNDV aggregate is to be reduced to 2,250 by 31 December, 1981. Each nation can determine the composition of the aggregates within the constraints of the following sublimits:
- A limit on MIRVed (Multiple Independently Targetable Re-entry Vehicle Systems), of 1,320 within the SNDV aggregate, consisting of MIRVed ICBMs, SLBMs and air-launched, cruise missile-carrying bombers, and to be reduced to 1,200 by June 30, 1981.
- MIRV US systems limited by this provision are the Poseidon SLBM, Minuteman II, Trident SLBM, MX, B-52, B-1, and any other ALCM carrier.
- A ceiling of 1,200 MIRVed ICBMs and SLBMS.
- A ceiling of 820 MIRVed ICBMs. Within this ceiling no more than 308 MIRVed ICBMs may consist of modern large ballistic missiles (the Soviet SS-18 ICBM).
- No "light," ICBMs can be converted to "heavy" ICBMs. No "heavies" built before 1964 (Titan II, SS-7, SS-8) may be modernized.
- Both parties agree not to develop, test or deploy ICBMs which have a launch weight or throw weight exceeding that of the heaviest deployed by either party at the date the treaty is signed. (The Soviet SS-18 is now the heaviest ICBM deployed by either party.) This provision, in combination with other proposed restrictions, limits the US to ICBMs with a throw weight less than half of that of the Soviet SS-18 in a fixed-silo basing mode.
- General agreement reportedly has been reached that improved SLBMs, including Tridents I and II and the Soviet "new" ICBM will be allowed for each side which is no heavier than the "destructive capacity" of the SS-19, or a throw weight of 3,500 KG. This permits deployment of all variants of the M-X. Existing ICBMs may be modernized within limits not yet of +5%. The Soviets wanted to allow lengths, diameters, launch weights, throw weights, propellants, and other characteristics to be 5% greater or 10% less than for systems being modified. US negotiators evidently got agreement that any variation greater or less than plus *or* minus 5% would constitute a "new" ICBM.
- Both parties agree not to begin construction of additional *fixed* ICBM launchers; and not to supply ICBM launcher deployment areas or storage facilities with missiles in excess of normal deployment, maintenance, training, and replacement requirements. One missile for each launcher will be defined as normal deployment practices.
- Both parties agree not to significantly increase (defined to be in excess of 15 %) the number of ICBM and SLBM test and training launchers. No silos may exist over the agreed limits.
- Both sides agree not to develop, test, or deploy systems for a rapid reload of ICBM launchers. "Cold launch" is permitted.
- Carriers that accommodate intermediate-range, air-launched cruise missiles (ALCMs) implicitly are confined to 120, unless one or both participants elect to employ fewer than 1,200 ballistic missiles. Exactly how many ALCMs each aircraft will be allowed to carry is still not clear. An average of 28 per aircraft is permitted, but no more than 20 on an existing aircraft. The US now plans to deploy 135 B-52G ALCM carriers, and give up 15 SLBMS.
- Cruise missiles with ranges in excess of 600 kilometers (372 miles) will be limited to heavy bombers. Heavy bombers are defined as the Soviet Bear and Bison and the US B-52 and B-1.
- Heavy bombers carrying cruise missiles will have externally observable differences (EOD) from those bombers which do not carry cruise missiles.
- Possible future ALCM carriers will have functionally related observable differences (FROD), from other similar planes and will be decided upon a case by case basis through the Standing Consultative Commission (SCC). Externally observable and functionally related observable differences refer to the ability of the United States and Soviet Union to determine, through the use of each country's national technical means of verification, whether aircraft of the same type (the B-52 and Backfire bombers, for example) are, or are not, capable of delivering cruise missiles.
- Both sides have agreed to a "breakout" provision which bans sudden departures from past deployments or practices that might later allow either side to rapidly build-up its capabilities after the treaty is signed. Breakout is a direct violation.
- A *de facto* upper limit of 17,000 is placed on the number of nuclear weapon each side's missile forces can carry. The US now has about 9,200 and the USSR about 5,000. However, the Soviet total is rising rapidly and should exceed 10,000 in 1985 versus a US maximum of 11,400-12,000.
- Both parties agree not to undertake initiatives, either directly or through third countries, which would circumvent or undermine the viability of the treaty. Both parties agree not to interfere with the national technical means of verification of the other, and not to take deliberate concealment measures which would impede the monitoring and verification of compliance with the terms of the agreement.
- Each party will provide an accounting of its deployed strategic forces.

Probable Protocol Terms

- Both parties agree not to deploy mobile ICBM launchers, flight test ICBMs from such launchers for the duration of the Protocol, and develop C³I links for launch away from silos.
- Neither side will flight test or deploy any new types of ICBMs, with one exception for each side to be negotiated. No limit will be placed on missile stockpiling or production per se. The Soviets have agreed not to produce, test, or deploy the SS-16.
- Both sides agree not to deploy cruise missiles from sea-based or land-based launchers with a range in excess of 600 kilometers.
- Both sides agree not to fractionate the payloads and increase the numbers of warheads on each missile over the numbers now on existing deployed systems.
- The proposed freeze on ICBM warhead deployment would mean the Soviet Union could not deploy more than 10 warheads on the SS-18 while the US Minuteman III ICBM would be limited to 3 warheads for each missile. The Soviet SS-17 and SS-19 ICBMs would carry 4 to 6 warheads respectively. All SLBM missiles will be permitted to carry up to 14 MIRVed warheads.
- Some limit, possibly 20, may be placed on ICBM tests during the period.
- Prohibits ballistic missiles launched from surface ships.
- Prohibits test and development of fractional orbital bombardment systems (FOBS), and seabed and/or missiles launched from fixed or unmanned sites on the ocean floor.
- Both sides recognize that the other may proceed with mobile ICBMs (the M-X), and long range GLCMs, and SLCMs when the protocol expires.

The Joint Statement of Principles

The Joint Statement of Principles to accompany a possible treaty, and which looks forward to possible SALT III negotiations, states that the objective of SALT III will be to:

• Achieve further reductions in the number of offensive strategic forces deployed and to provide qualitative limitations on those forces.
• Address Soviet "gray area" systems and so-called US forward-based systems. These include, intermediate range ballistic missiles, ground-launched and sea-launched cruise missiles, theater based FB-111 bombers and carrier based aircraft.
• Strengthen strategic stability through the maintenance and enhancement of the survivability of those strategic weapons permitted under SALT II.

The Agreement

The agreement also provides that:
• Both parties agree SALT II is not a "precedent" for SALT III.
• An exchange of statements will take place on the Backfire bomber.
• Soviet Backfire can be excluded from the aggregate of delivery systems if the Soviets inhibit effective use in an intercontinental role, and impose limits on production rate of about 30 per year.
• Both sides must notify the other of long range land based missile tests unless it occurs within the boundaries of Soviet territory.
• Both sides will exchange a data base of facts and figures on its nuclear arsenal.

Exemptions

The agreement excludes theater, Naval, and Allied nuclear delivery systems and weapons that can strike rival homelands from the restrictions in the primary pact and protocol. It also excludes US forward-based tactical aircraft, ashore and afloat; medium-range bombers, such as US FB-111s and Soviet Badgers and Backfire; and land and submarine strategic missile launchers belonging to Britain, France, and China.

Medium and intermediate-range ballistic missiles (MRBMs, IRBMs) are also exempt, even though both superpowers brought such systems to bear directly on each other in the past (from countries like Turkey and Cuba), and could do so again.

Unresolved Issues

At this writing, the result of the negotiations is still uncertain regarding:
• Exactly what form of US MPS basing, if any, would meet the verification requirements;
• The nature of the declaration the Soviets have agreed to make regarding the size and capability of their forces, and over what kinds of "relevant" telemetry may and may not be encrypted. The US is arguing for none; the Soviets are arguing that non-encryption applies only to the force capabilities covered in the agreement, and factors like accuracy and throw weight may be encrypted.
• The meaning of the non-circumvention provisions. The US has privately assured the UK it will provide weapons to modernize British strategic forces, but the Soviets have not agreed.
• Whether the definition of "new type" of ICBM will or will not prohibit the Soviets from both replacing their single warhead SS-11s with a smaller system with more reliability and counterforce accuracy, and deploying one of the several types of 5th generation ICBM they have under development—at least one of which is twice the size of the largest variant of the M-X. The US seems to have gotten a limit on changes to the size of existing ICBMs that would prevent the USSR from, in effect, being able to deploy two new types of missiles.
• The exact wording of the limits on ICBM fractionation to 10 RVs, and SLBM fractionation to 14 RVs.
• Whether non-strategic cruise missiles such as reconnaissance RPVs should come under the 600 km range ceiling. The US says no, the Soviets say yes.
• The exact wording of the letters to be exchanged on Backfire.

While some of these issues are potentially serious, most negotiators seem to feel they can be resolved in a way which conforms with the letter and spirit of the basic agreement. The most potentially dangerous issues seem to be (a) the risk of a prohibition of MPS basing for the M-X, and (b) a definition of "new type" of ICBM that would let the USSR deploy two new types instead of one. ■☆■

SALT II: Better Than Alternative Forms of US Inferiority

VARIOUS COMMENTATORS such as Richard Burt have done a good job of publicizing how the provisions of SALT II have evolved since Vladivostock. Spokesman like Les Aspin and Jan Lodal have argued the wisdom of the US negotiating posture; spokesmen like Paul Nitze and Jack Kemp have argued its weakness. At a given point, however, the debate over how SALT II has evolved takes on many of the weaknesses of medieval scholasticism: the issue is not what might have been or what might be, but rather what is.

The key test of SALT II is now, therefore, whether it provides a better starting point for strategic inferiority than indefinite negotiation under ground rules of SALT I and the Vladivostock accords, or unconstrained competition with the USSR. Given US and Soviet expenditures, US and Soviet force trends, and the weaknesses in US force improvement plans—the answer is obvious. SALT II seems to be about the best the US can expect.

The SALT II Bargain is Slightly Better Than SALT I or None

The impact of SALT II on the future strategic balance is illustrated in Tables Two and Three. Table Two, shows the agreement's impact on total US and Soviet force levels. Table Three, modified from an article in *Congressional Quarterly*, shows how the agreement will affect planned US and Soviet force improvements.

Although the precise details of SALT II are more complicated than these tables can display, they show that SALT II would probably place a tigher cap on the growth of Soviet strategic forces in the early 1980s than would unconstrained competition or continuing under the limits of SALT I and the Vladivostock ceiling.

The main advantage of SALT II for the US will be the limits on Soviet conversion to a fifth generation of ICBMs, and on the rate of growth in Soviet counterforce capabilities against Minuteman. SALT II will not otherwise prevent the USSR from exploiting its vastly superior spending to achieve superior capabilities within the ceiling imposed, or in easing the Minuteman vulnerability problem. Its merit is only that it will set some useful term limits on some aspects of the growth of Soviet forces, without precluding those force improvements the US is likely to be able to fund.

No Credibly Negotiable Agreement Can Deal with the Real Arms Control Issues

There are, of course, a hundred possible variations on the agreement reached this May, and countless uncertainties inherent in the present treaty and protocol. The key potential variations of the present SALT II agreement which are now being debated include:

• **Seeking a cap on Backfire, and possibly on related US FB-111 and strategic mission capable theater aircraft.** This is probably now unnegotiable, but the Soviet agreement now in SALT II—to not deploy Backfire to artic bases where they could be used for strategic missions or train for simulated strategic missions—has already become meaningless. Improvements in the Backfire's range, refueling, and avionics will allow it to be used as a strategic bomber without any peacetime operational experience from arctic bases, and training for theater missions is becoming so sophisticated that no observable differences will exist between simulated strategic and theater nuclear missions.

The whole bomber variant issue is moot in any case because the Soviet testing of ALCMs with ranges 750-1,500 km on Backfire effectively precludes a "strategic" "non-strategic" distinction.

• **Giving the US greater flexibility to deploy cruise missile carriers with capacities above 20-28 missiles.** The

number of ALCMs a cruise missile carrier (CMC) can carry is a marginal issue relative to the Soviet concession on range. It is difficult to postulate a credible sequence of strikes and counter-strikes where a higher average aircraft load than 28 ALCMs would make much difference.

• **Establishing a limit on ICBM missiles rather than on fixed launch sites.** While desirable, such a limit is impractical and unverifiable. Even when it had far better access, US intelligence was never able to count Soviet missiles as distinguished from fixed launchers, and massively underestimated inventories of Soviet IRBMs and SRBMs. Unlike the US, the Soviets continuously produce ICBMs, and constantly move them around the USSR, often with transport units which cannot be distinguished from a launch capability unless their ELINT profile reveals a C³I test. There is no way the US can constrain the USSR from building up a major cold launch reload capability. (Experts provide estimates for reloading Soviet silos of 2 to 8 hours, or less than the time it would take a US ALCM to arrive at a counterforce target.) Or, from covertly establishing battle management data links to ICBMs not at fixed launch locations.

Recent intelligence studies have also shown the USSR could have stockpiled 900 or more of the older missiles it has phased out of its silos, and there is no clear picture of how many additional ICBMs it could have produced. Further, the Soviets have long moved their ICBMs from the production plants at Moscow, Gorki, Knepropetrovsk, and Bik in random batches, and full coverage of such movements is impossible because of night and weather conditions. The Soviets also regularly move ICBMs out of their silos for maintenance—key warhead components like gyros must be regularly replaced—and this makes it impossible to verify the "float" of missiles used as maintenance replacements.

It is thus possible that the Soviets could already have well over 1,000 more missiles than silos, and most of these could now be fired with countervalue accuracy with only limited and unobservable data links from any pre-surveyed site.

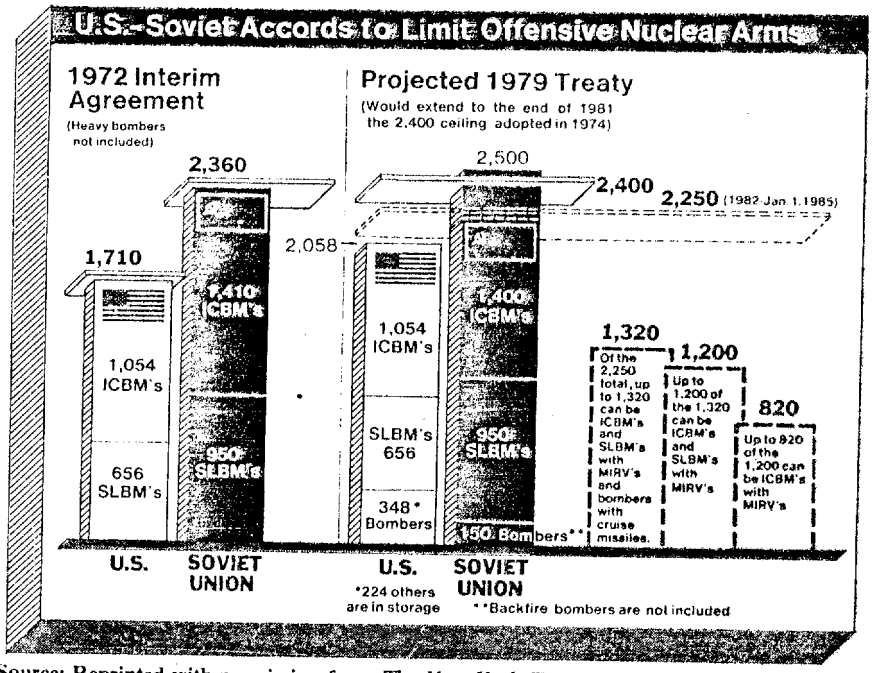
It is more doubtful that such installations could now achieve total system counterforce accuracies even with the SS-17, SS-18 and SS-19. However, Soviet data link systems will almost certainly improve by the early 1980s to the point where first strike counterforce battle management capabilities could be rapidly set up at improvised launch locations with virtually no chance of advance detection.

• **Setting limits on the SS-20 and/or removing restrictions on the range of NATO based cruise missiles.** This also is probably now unnegotiable. It is also probably no longer possible to verify SS-20 missile numbers, as distinguished from launchers at fixed sites, and the Administration is probably more of a barrier to developing effective NATO theater nuclear systems than the SALT II agreement. In any case, the agreement will expire before an effective GLCM could be deployed, and the "fog of peace" in NATO nuclear planning is so dense that there seems little prospect NATO could create a balanced and less vulnerable mix of TNW systems to compensate for its present range limitations and first strike vulnerability.

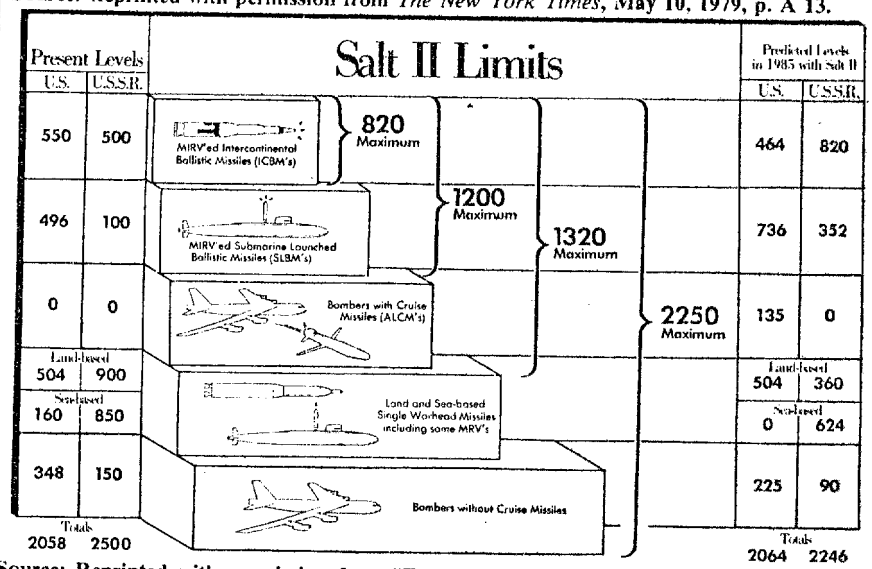
• **Setting limits on mobile ICBM developments.** For similar reasons, it is simply too late to set effective limits on mobile ICBMs. First, there is reciprocity: the M-X must be mobile in either the air-launch or MAP mode, and advances in the US strategic C³I and battle management system, and the M-X's retargeting and navigation system, will make it impossible for the USSR to verify whether M-X missiles away from silos or launch aircraft can be used as mobile ICBMs as it is for the US to verify this for Soviet ICBMs.

Second, the combination of the SS-20 (which can be given ICBM range by using one 200 KT RV rather than three); and the uncounted float of Soviet ICBMs in storage, reload, or transit status; means the US can never verify the number of Soviet mobile ICBMs. Third, the stage of the SS-16 mobile ICBM can be added to the 20, they use canisters so similar as to be undistinguishable. Even without such deception, there are some

Table Two
Major SALT II Constraints on Total US and Soviet Force Growth



Source: Reprinted with permission from *The New York Times*, May 10, 1979, p. A 13.



Source: Reprinted with permission from "Trying to Slow the Superpower Arms Race," by Robert G. Kaiser, *The Washington Post*, May 10, 1979, p. A 17.

indications the SS-20 has been tested with ballast weight whose removal might allow them to be fired as ICBMs even without a reduction in RVs.

• **Freezing SSBN and/or SLBM Numbers and Types.** The USSR will never agree to the freeze of its mix of SSBN and SSCN numbers and types. This will always give the USSR come capability to be (a) slightly over its permitted number of SSBNs (because of commission, R&D test bed, and de-commissioning shifts), and (b) able to improve its SSCN force to extend its strategic mission capabilities. (The Soviet SS-N-3/12 SLCM has a range of 150-250 nm, which does not count as strategic given the 600 [372 nm] limit on cruise missiles in SALT II, but which could hit half the US population from beyond the Continental shelf.) Further, such a freeze on SSBNs and SSCNs would be largely meaningless since it would not affect Soviet ability to deploy SLBMs with counterforce (PGRV) accuracies, or depressed trajectory capabilites, which could cut warning to US bomber bases far below the 15 minutes needed for the takeoff of alert aircraft.

The lack of such controls may, however, be critical in shaping the future strategic balance. The USSR already has 950 launch tubes (62 submarines) to 656 (41 submarines) for the US. At present, the US compensates for this by having 496 MIRVed SLBM launchers out of 565 launch tubes with 4,960 warheads vs. only 130 Soviet MIRVed launchers with 380 MIRVed SLBMs. This means the Soviets could deploy up to 5,320 warheads under SALT II vs. 390 today. Even with countervalue accuracy, such a force could potentially destroy all US bombers on off alert status and much of the airborne M-X force. With counterforce or PGRV accuracy, they might eventually threaten even an MPS based M-X force, as well as the US bomber CMC force.

• **Freezing Actual RV or Warhead Numbers.** When the US stopped producing weapons grade uranium, the USSR actually increased its production. Coupled to the severe uncertainties in estimating Soviet U-239 production, there are virtually no nuclear material limits on Soviet capability to fractionate the total number of ICBM and SLBM warheads permitted by SALT II.

In the past, this would not have mattered because Soviet MIRVing capability was so limited that the USSR could not take advantage of its high throw weights to deploy large numbers of RVs on each missiles; and because Soviet re-entry, post-boost vehicle, and accuracy technology had not approached the stage where it was remotely credible the Soviets would deploy a highly fractionated warhead they had not repeatedly tested. However, the Soviets may already have virtually caught up with the US, and can test 14 RV warheads for their SLBMs under the SALT II agreement.

It seems likely, therefore, that they could deploy warhead packages for the SS-18 and SS-19 without having tested the full RV load, and still have reasonable confidence of success in countervalue strikes. Similarly, successful Soviet development of PGRVs might allow them to similarly "pack" their heavy ICBMs and SLBMs with counterforce weapons without prior

Table Three
Impact of SALT II Treaty on Major US and Soviet Force Improvement Options of the Early to Mid-1980s

Provision	Effect on Announced US Programs	Effect on Reported Soviet Programs
Treaty [effective through 1985]		
• Ceiling of 2,250 on all strategic launchers [effective as of 1982—limit is 2,400 until then].	• None. US would not fund such improvements in any case.	• By 1982 must scrap about 150-200 older launchers. More would have to be scrapped sooner if additional missile submarines were built.
• Ceiling of 820 on ICBMs with MIRVed warheads.	• Indirect. M-X [only new ICBM] will not be deployed until after 1987.	• If ICBM production continues at rate of about 100-150 annually, replacement of older missiles in fixed launch sites with new MIRVed ICBMs would have to stop about 1982.
• Ceiling of 1,200 on ICBMs and SLBMs with MIRVed warheads.	• None until the 7th Trident submarine goes to sea [post-85]. Then, it could force retirement of Minuteman IIIs or Poseidons to allow for more Tridents.	• Apparently would prevent replacing SSN-6 sea-based missile with MIRVed missile.
• Limit of 20-28 ALCMs per bomber.	• May halt US wide bodied carrier.	• None.
• Ceiling of 1,320 on all MIRVed missiles plus bombers carrying long-range cruise missiles. Bombers with ALCMs with range over 600 km must count in ceiling.	• Could limit to 120 the number of B-52s modified to carry cruise missiles unless MIRVed missiles are retired to allow more. At the planned rate, the 120th plane would be modified at about the same time the treaty expired.	• Uncertain. Existing Soviet cruise missiles apparently have short ranges [less than 600 km]. These include one type transported by air, one-to-a-bomber, and about 300 of another type carried on 46 older submarines. But have recently tested ALCMs with 750-1,500 km ranges.
• Limit of 10 RVs on ICBMs, and 14 on SLBMs.	• None. M-X limited to 10 warheads by Trident compatibility.	• Soviets more likely to pursue MaRV, PGRV options for post treaty period, but SS-18 and SS-19 could launch 20-40 MIRVs each.
• No new land-based launchers for missiles larger than the Soviet SS-19.	• None. M-X is projected to be slightly smaller than the SS-19. US will have no missiles the size of the Soviet SS-18.	• Limits the number of launchers for SS-18s to 308. Unlikely Soviets would need more given current MIRV technology. SS-19 is a "Heavy" ICBM by SALT I definition.
• Only one new type of ICBM could be tested or deployed during the life of the treaty.	• None. Only M-X is under development. [Theoretically limits MIRVed ICBM warheads to 1,650 and bars more accurate single warheads.]	• Allows only one of four "5th Generation" new missiles under development. [Theoretically limits MIRVed ICBM warheads to 6,084.] Soviets will probably also seek to replace SS-11.
• No circumvention of treaty by transferring controlled weapons to any third country.	• Depending on final wording, could bar assistance to British strategic forces and to NATO in developing cruise missiles, including non-nuclear armed version.	• None. No Soviet allies have ever been given nuclear launchers with a range of more than a few hundred miles.
• No interference with techniques each country currently uses to verify other's compliance with treaty provisions.	• None, but may have limited value if facilities in Turkey and Iran are both lost in 1980s.	• Would bar coding of telemetry information radioed from test missiles. Can still hide many key improvements.
Protocol [effective through 1981]		
• No test or deployment of mobile ICBM.	• Indirect. M-X would not be tested until after 1982, but sets precedent.	• Prohibits deployment of mobile version of SS-16, testing of which has been completed.
• No deployment of ground-launched or sea-launched cruise missiles with more than a 600 km range.	• Depending on final wording, could bar [or at least delay] development of long range cruise missiles for use in NATO. Implies limits on NATO MRBM options.	• Indirect. Backfire has tested ALCM with 750 km plus ranges. Status unclear.

Source: Adapted with major revisions from *Congressional Quarterly*, "Nuclear Hardware Debate Masks SALT Political Issues", Jan. 6, 1979, p. 9.

testing of the *full* fraction of the [illegible] bases in Iran. late 1980s. Short of on-site inspection and physical disassembly, there would be no way to detect this, and the potential build-up in Soviet ICBM and SLBM warhead numbers could be incredible.

Accordingly, there seems to be essential-control on Soviet warhead numbers, or Soviet damage capability to the US. Further, even a few "illegal" Soviet tests could greatly enhance such a warhead breakout capability, and it is unclear the US could have fully characterized such

There Are Some Negotiable Issues, But Their Real Impact is Marginal

As has been discussed earlier, there are some more technical issues which may still be negotiable and which do need resolution. The key issues involved include:

Table Four

US Verification Capability for the Major Soviet Force Improvements Constrained in SALT II

Part I: Treaty Provision	Cheating Method		Aspin Estimate of Potential for Undetected Activity	Actual Level of Current and Potential Uncertainty
1. Ceiling on total number of launchers [2,400-2,250]	Deploying new strategic systems		None	Some. Can upgrade existing SLBMs, ICBMs, SLCMs, MRBMs, to "new" level of capability.
	Deploying more of existing systems	SLBMs	None	Moderate. Considerable uncertainty in total commissioning-decommissioning balances in past.
		Bombers	None	Irrelevant. Issues are mix of new and existing bomers, and exact capability of existing Bear and Bison.
		ICBMs	Maximum of 100	High. Can verify fixed launch sites, not missile numbers. Uncertainty could exceed 1,000.
	Converting non-strategic systems to strategic systems	Backfire, new production and deployment	None	Marginal. Could conceal at least some in "float."
		Backfire, employing tankers for in-flight refueling	Minor	ALCM and existing range improvements make somewhat moot issue.
		Backfire, upgrading range and payload	Sizable	Has already occurred.
		SS-20, upgrading to SS-16	Minor	High. SS-20 is an ICBM if it has only one RV rather than three, and possibly if "ballast" is removed.
		Converting reconfigured bombers	Maximum of 12	Real issue will be total number of bombers if new heavy bombers are deployed. Could be significant uncertainty.
2. Ceiling on MIRVed ICBMs and SLBMs plus bombers armed with ALCMs [1,320-1,200]	Constructing new missile silos or submarine launching tubes		None	Some for SLBM "stretchouts." High for ICBM/SLBM launch from erectors or non-fixed launch points.
	Substituting MIRVed missiles for unMIRVed ones in existing silos or submarines.		None	Uncertain. Soviets probably now have technical capability. Would be reliability and detection risks. Easiest for SSBNs.
	Deploying MIRVed payloads on unMIRVed missiles in existing silos or submarines		None with present systems; potentially large with future systems	Agreed.
	Placing ALCMs on strategic bombers		None in near future; minor in early 1980s	Highly uncertain. Depends on whether and how new heavy bomber is deployed.
3. Ceiling on MLBMs [306]	Upgrading non-MLBMs to MLBMs		None	Irrelevant. The SS-19 is a "heavy" ICBM in throw weight. Distinction meaningless.
4. Ban on rapid-reload systems	Deploying rapid-reload systems		None	Definitional problem. Do not need to reload silos to fire. Can probably reload many now before ALCM counterstrike hits.
Part II: Protocol				
1. Ban on mobile ICBMs	Deploying mobile ICBMs		None	Meaningless. SS-20 is a "mobile ICBM." C^3I systems will improve to point to where can erect and launch virtually all ICBMs and SLBMs from any location.
2. Ban on Strategic cruise missiles	Deploying cruise missiles on land-based or sea-based launchers with a range in excess of 600 km		None	Uncertain and misleading. Half US population on coast less than 600 km from SLCM launch point.
3. Limitations on new types of ballistic missiles	Flight testing and deploying new types of ICBM missiles		Probably none	May permit enough tests [20-30] as to make violation unnecessary. SLBM and MRBM tests can be used.

Source: Adapted from Les Aspin, "Verification of The SALT II Agreement," *Scientific American*, February 1979.

• **Clarification of what kind of SS-11 replacement can be deployed as the one permitted new Soviet ICBMs, and whether the Soviets can deploy one "new" ICBM or two.** Although the US evidently won the argument over size, and set lower limits of 5% when the USSR evidently needed 10% for its SS-11 replacement, it is absolutely essential that the Soviets should not be able to deploy both a new "5th generation" ICBM and an SS-11 replacement with counterforce accuracy.

• **Exactly clarfying the number of ICBM test shots permitted before the Soviets choose their new type.** The number may already be 20. Larger numbers, however, could result in the Soviets bringing all of their fifth generation types to "breakout" readiness for rapid deployment after the agreement expires.

• **Clarifying the overall warhead packages the Soviets can test.** The argument over whether the USSR continues to test the SS-18 with 12 to 14 warheads is largely meaningless unless better limits are placed on the total testing of RVs and decoys for ICBMs. and on SLBM warhead tests. While it seems any negotiable limits will be more symbolic than real, there should be a precise understanding of the risks involved, and of Soviet breakout ability to raise the MIRV packages on the SS-18 and SS-19 to 20-25 RVs.

• **Reaching agreement that mothballed B-52s and the four B-1 prototypes should not be counted in the ceiling.** While it is too late to constrain the Soviet Backfire build-up, the US can credibly distinguish active from inactive US bombers where there are observable differences.

• **Explicit permission of US MPS deployment.** The US can seek explicit agreement that MPS-type deployment of the M-X is permitted. As has already been discussed, the Soviets now have a mobile ICBM capability, and planned improvements in US forces will give the M-X missile an unverifiable mobile ICBM upgrade capability regardless of whether it is land or air launched.

Some other issues seem largely meaningless. The demand that the US be given explicit permission to deploy equal numbers of heavy ICBMs is largely pointless since (a) the US cannot develop and deploy a new system during the life of the treaty, (b) the M-X could be upgraded to carry large numbers of countervalue RVs in the mid-1980s if it is MPS based, (c) the US would do better to raise the RV limit on its SLBMs to the permitted level of 14.

Thus, depending on the final "official" SALT II package presented to Congress, there are some points worth debating and possibly even worth retabling with the Soviets. None, however, really have much impact on the future balance in terms of deterrence, associated political influence, or war fighting capability. They are not real tests of the SALT II agreement, but rather debating points for those unwilling to accept the reality and fact of US inferiority.

Table Five

Unconstrained Areas of Soviet Force Improvement and Uncertain US Intelligence Capabilities

Area of Permitted Improvement

Missile Accuracy and Performance	Estimated Intelligence Collection and Analysis Capability
• Intention behind MIRV and warhead configuration	Limited. Payload fractionalization very difficult to establish.
• Accuracy	Difficult for ICBM CEPS below 0.1 nm, and SLBMs below 0.25nm.
• MaRV and Evader capability	Difficult to predict. Level of performance uncertain.
• PGRV capability	Detectable, but prediction, reliability, and performance uncertain.
• Warhead yield	Limited. Major error possible.
• Reliability	Controversial even for US systems.
• Number of RVs actually deployed within limit of 10 on ICBM, 14 on SLBM.	Prediction difficult. Capabilities could drop sharply as Soviet technology improves.
• Silo and Shelter hardness	Limited.
• Time on Target	Uncertain. Controversial now. Must assume Soviets will fully solve all systems problems for one ground burst, one air burst, and reprogramming by mid-1980s.
• SLBM range and performance	Poor to Moderate. Poor prediction.
• Depressed trajectory SLBM	Controversial, should be good.
• SSBN performance	Prediction of development and deployment good. Performance difficult to predict.
• New ICBM and SLBM basing.	Poor detectability unless SSBN or silo based. Prediction of new basing concepts very uncertain.
• New bomber IOC and performance	Prediction of IOC and deployment rates poor. Detection good. Performance uncertain.
• Improved ALCM performance	Uncertain. New configurations are easy to detect, but total systems performance is difficult.
• SLBM, SLGM performance and targeting	Deployment good at least through mid-1980s. "Theater" systems could have significant strategic capability if not limited by SALT III. Performance uncertain.
• Peripheral systems with strategic range	Limited.

Command, Control, and Intelligence Capability

• Simultaneous strike capability, Time on Target	Difficult. Even Soviets may not know until they try.
• LNO, RNO, countervailing targeting and trans-attack conflict management	Actual level of capability almost impossible to establish.
• Launch on/through warning	Probably already exists. Improvements in performance will be extremely difficult to verify.
• ASAT technology	Highly controversial.
• Command and control survivability	Good with inevitable lag times.
• Battle management systems	Vary sharply by activity. Increasingly subject to advanced encryption or deception. Performance attained very difficult to evaluate.
• Targeting, re-targeting, and re-programming capability	Difficult to evaluate except for broad technical capabilities. Subject to concealment and deception.

Strategic Defense

• ASW	Good.
• Air defense fighter	Moderate to good, as to basic features and capabilities. Actual system performance and lethality poor.
• AWACs	Detection good, performance uncertain.
• SAM capability, and radar netting	Prediction poor. Detection good, performance uncertain.
• ECM/ECCM	Increasingly uncertain as Soviet technology improves.
• Anti-ALCM capability	Controversial. Should be good until mid-1980s.
• ABM technology	Already area of public controversy; e.g. Hen House and ABM-X-3.
• High energy laser or Particle Beam Defense	Probably easy to detect. Hard to predict. Difficult to evaluate performance.

Source: Adapted from various sources including the articles of Col. Asa Bates, Jr.; Jack F. Kemp, "Congressional Expectations of SALT II," *Strategic Review*, Winter '79; and Les Aspin, "Verification of the SALT II Agreement," *Scientific American*. February '79.

Table Six

Playing the "Pros" and "Cons" Game with SALT II

"Pro"	"Con"
Overall Impact	
• Set some tangible constraints on the rate of improvement in Soviet strategic delivery systems.	• Does not constrain or limit actual warfighting capabilities.
• Puts far more restraint on Soviet build-up than Vladivostock accords, or no agreement.	• Expires at point when US lead in technology is likely to have vanished, and US may have been overtaken. Could give Soviets ICBM, and ABM breakout capability.
• Avoids all-out competition with USSR. Encourages Soviet "moderates." Avoids "bi-polar" USSR vs. US and PRC world.	• Allows Soviets to exploit superior payloads to build-up massive advantage in MIRVs, MaRVs, and PGRVs in mid-1980s, and lead in prompt counterforce kill.
• Establishes equal ceiling for delivery systems, ICBM and SLBM launchers, MIRVed launchers; and MIRV ICBM/SLBM launchers.	• No effective constraint on Soviet advantage in soft target kill capability.
• Affords equal freedom to mix systems, except for ICBMs.	• No effective limit on Soviet ability to shift superior expenditures to upgrade ungrade unconstrained aspects of strategic force structure.
• No major constraint on current US FY 1980 improvement plans, or Committee on the Present Danger program for restoring real and perceived strategic adequacy in the 1980s.	• No limits on Soviets deploying new type of heavy bomber, new SSBNs, ALCMs, ICBM basing, or on improved civil defense, recovery capability, strategic air defense, ABM technology, and ASAT capability.
• No practical constrain on deployment of B-52 with ACLM, M-X, Trident I and Trident II.	• Soviets could create serious post recovery gap by mid-1980s.
• Preserves "Essential Equivalence" in "Functionally Related Observable Differences" [FRODS].	• Excludes many systems including GLCMs, SLCMs, and SS-20.
• Soviets dismantle 150 older systems; no effect on US force levels.	• Pushes US towards "doomsday" option of launch under attack.
• No threat of Soviet "war-winning" capability during life of treaty.	
• Post recovery acceptable and does not credibly threaten deterrence.	
• US will be able to cover all key Soviet targets under worst case assumptions in second or follow-on strike mode.	
• US has "launch under attack option".	
ICBM Forces	
• Creates equal ceiling on total launchers, MIRVed missile launchers, and total MIRVed ICBM/SLBM launchers.	• Force levels allowed so high SALT II has little warfighting impact.
• Sets limit on MIRV warheads of 10 on ICBMs and 14 on SLBMs, but will not affect Trident I, Trident II, or M-X programs.	• Tends to institutionalize US inferiority in total fixed site ICBM launchers and modern heavy ICBMs.
• Does not force US to count Minuteman II as MIRVed system.	• US can only have 3 warheads on each ICBM, and cannot upgrade Minuteman III to a maximum of 6 counterforce warheads or 7 "Pave Pepper" counter-value warheads. USSR will have 4 warheads on the SS-17, 6 on the SS-19, and 10 on the SS-18.
• Limits Soviets to 350 heavy ICBMs no larger than SS-18. No evidence Soviets will deploy more than 150 heavy ICBMs.	• Ineffective limits on Soviet ability to fractionate and MIRV.
• New sub-limit of 820 on land based MIRVs will put practical limit on growth of Soviet warheads.	• Soviets retain monopoly of 308 heavy ICBMs, and maximum US throw weight must be less than half that of SS-18. Soviets have delayed build-up in SS-18 only until they could develop accurate RVs. Limit of 10 RVs would allow them to deploy 3,500 counterforce weapons on this one system.
• Numerical limits on missile launchers now equal for both sides.	• SS-19, with 6 warheads tested, is a "heavy" ICBM by SALT I definition. Could increase warheads to 10 under treaty. Can carry up to 25 countervalue warheads, and SS-18 up to 40.
• Soviets terminate SS-16 ICBM deployment in mobile or fixed sites.	• USSR will have full limit of 820 MIRVed ICBM launchers when treaty expires. US will have 550 of permitted 820.
• Leaves US option of eliminating Minuteman vulnerability problem. MAPS, MPS, and most US basing variants permitted.	• Limits launchers, not ballistic missiles.
• Forbids fractional orbital bombardment testing and development.	• USSR may be able to replace SS-11s with single warhead 5th Generation ICBM.
	• We have no knowledge of current Soviet ICBM re-load or erect and launch capability.
	• Battle/management and retargeting/navigation technology advancing to where any missile not in silo can be used as "mobile" ICBM. SS-20 can be used as mobile ICBM.
SLBM Forces	
• No credible threat to US SSBM force during life of treaty.	• No meaningful limits on Soviet SSBN upgrade capability.
• No constraint on US SSBN improvement plans.	• Soviet SLCMs can already threaten 50% of US population. Not covered.
• No limit on Trident I and Trident II SLBM deployments.	• Permitting MIRVing of Soviet SLBM force allows growth from 390 MIRVed warheads to any desired mix of 1,200 ICBMs and SLBMs with 14 RVs per SLBM. PGRVs could give USSR massive lead.
• May prevent Soviet actions to cover SSBN production from PHOTOTINT verification.	• Does not limit SLBM improvements such as depressed trajectory firings to reduce warning, or improvements in accuracy that would give SLBMs a counterforce capability.
• No seabed testing and development.	
• No surface ship based strategic ballistic missiles.	
Bomber Forces	
• No critical range limitations on permitted strategic ALCMs. Little threat to B-52 ALCM force.	• May prevent US from deploying a wide-bodied cruise missile aircraft with more than 25-35 ALCM.
• Restricts Soviet bomber variants not included in treaty ceilings.	• Weak constraints on Backfire. USSR will have 300-400 by 1985. US will have 12 F-111 squadrons.
• US can deploy up to 3,000 cruise missiles without cutting other strategic forces.	
Impact on NATO and US Allies	
• "Countervailing Strategy" preserves coupling of NATO and US strategic forces.	• Implies decoupling of US strategic forces from NATO and allies.
• Leaves USSR facing additional threat from PRC and NATO theater forces.	• Tends to institutionalize NATO inferiority in TNW.
• US has assured UK it will help update its independent deterrent.	• Limits US ability to deploy GLCMs in support of NATO. Implies limit on any deployment of MRBM with ranges beyond 1,000 NM, or strike bomber superior to F-111.
• No specific limits on Pershing II, or a NATO MRBM.	• Soviets have not agreed US can provide aid to UK.
Verification	
• Specific, if still undisclosed, ban on visual and encryption barriers to verification.	• Does not solve such critical verification problems as MIRVs per missile, cruise missiles per aircraft, cruise missile performance, mobile ICBMs and total missiles.
	• Largely limits quantitative, not qualitative, improvements. Verification provisions strongest where matter least.
	• Soviets can organize unencrypted data in ways US cannot interpret, or use telemetry bypass.

The Climate of Uncertainty:

Verification and Permitted Force Improvements

THE UNCERTAINTIES inherent in SALT II are considerably more important than the negotiable and unnegotiable changes now being debated. While there is nothing the US can do to reduce most such uncertainties, it is essential to understand how little SALT II can do to arrest the shifts taking place in the balance. Above all, SALT II must not be judged on the basis of unrealistic expectations regarding our ability to predict or verify the changes that take place in Soviet strategic forces, or that the quality of verification will make much difference.

The Classic View of Verification

The classic view of verification is that US photo and signals intelligence can monitor all critical changes in the size and quality of Soviet strategic forces, and can verify any significant violations as they occur. There are, however, several major problems with this approach to the role intelligence can and should play:

- US Intelligence has consistently failed to predict the rate of improvement in Soviet strategic nuclear capabilities during the last decade. As Albert Wohlstetter documented in "Legends of the Strategic Arms Race", the US Intelligence Community consistently failed to predict the rate of qualitative and quantitative improvement in Soviet ICBM forces in the period up to 1975. Its record has, if anything, been worse since 1975, and has been no better in regard to Backfire, SS-20, and Soviet SLBMs. Long before the loss of Iran, and Soviet telemetry encryption, the US Intelligence Community demonstrated that it could not predict the trends in Soviet forces with a far simpler Soviet force to monitor, and far better strategic reconnaissance access to Soviet forces and R&D efforts.
- The nature of the strategic arms race hinges more and more on "breakout" capability to rapidly deploy new systems, on the exact capability of battle management capability, on the precise number and type of RVs on Soviet ICBMs and SLBMs, and on ICBM and SLBM accuracy. Barring massive technical or Human Intelligence (HUMINT) breakthroughs, photo and signals intelligence cannot track such aspects of the arms race with accuracy and confidence. For complex technical reasons, SLBM accuracy below 0.25 nm, and ICBM accuracy below 0.12 nm, would be extremely difficult to verify with any accuracy—even if the US retained all of its past foreign collection assets, and the Soviets did not encrypt.
- Capability to verify—even when it exists—is not capability to predict or interpret. There is no reason to assume that even the best verification capability would allow us to predict Soviet actions, and the "A Team-B Team" debate over the 1976 NIE on Soviet strategic forces (NIE-11-3-8) publicly revealed that no agreement exists in the US Intelligence Community regarding Soviet strategic tactics, war plans, and intentions.

The extent of the gap between the classic view of verification and reality is further illustrated in Table Four. It compares Congressman Les Aspin's "pro" verification view of SALT II, in the *Scientific American* against what verification can realistically be expected to accomplish. Yet, the fact this chart somewhat haplessly exaggerates US verification capabilities is not an argument against SALT II. No arms control agreement or possible future agreement could guard the US against massive uncertainties even if the US had the strength and will to maintain a qualitative lead and technical parity.

"Verification vs. Prediction"

CIA Director Stansfield Turner recently ran into a buzzsaw with both the Congress and the Administration when he attempted to distinguish between the ability to "monitor"—that is detect broad changes in Soviet strategic capabilities—and the ability to "verify"—which requires sufficient proof to establish a violation by some politically defined criteria. In fairness to Turner, however, he was making a valid distinction. Intelligence is not an extension of an international court, it is organized to make estimates which invariably have a significant degree of uncertainty and potential error.

There is an even greater difference between the Intelligence Community's capability to "verify" and its capability to "predict." In many critical aspects of Soviet strategic forces, there are no firm indicators an improvement is taking place until new systems are on the edge of deployment. In such cases, intelligence can systematically guess or estimate, but has no privileged insight into Soviet actions or intentions. This is the explanation behind the intelligence "failures" just listed, and it will be equally true with or without a SALT II treaty, and with or without encryption.

But, "prediction" is inevitably more important than both "monitoring" and "verification." It may do little good to verify a drastic increase in permitted or unpermitted Soviet capabilities *after* it occurs: the US may never have time to react. It is essential that the US have the lead time in which to act, and this requires "prediction."

Further, there is a serious risk in becoming obsessed with "verification". The US may end up focusing a massive amount of its intelligence resources on trying to be able to establish the exact nature of any violations *after* they occur, and fail to focus on the overall trends in the balance or on other options for Soviet force improvements and may fail to provide coverage of other more important areas.

An Unverifiable and Unconstrained Future With or Without SALT II

Unfortunately, the USSR can also make virtually all the improvements it could desire in its strategic forces without violating SALT II, or being subject to "verification." The SALT II agreement provides comparatively little incentive to cheat, because it provides so many legitimate and quasi-legitimate force improvement options. The Soviets can thus steadily improve their forces without taking the risk of actions which, if discovered, could shake the US out of its present strategic lethargy.

Ironically, just as the Washington Naval Arms Treaty failed to constrain the development of the aircraft carrier, which became the key Naval weapon of World War II; and just as SALT I became technically obsolete before it was accepted because of MIRVing; SALT II also lags reality. The strategic arms race is so important that it technologically outpaces any negotiable and verifiable process of arms control.

This is illustrated in Table Five, which highlights the absurdity of the present narrow debate about verifiability. While some of the conclusions in this table are debatable, it should be clear that it makes little real difference whether the US can restore the exact SIGINT collection capability of its bases in Iran in one, three, or five years.

Quite simply, we are moving out of the era in which Soviet strategic technology was so limited that photo and signals intelligence could allow us to plan our forces as if we had a reasonable precise picture of at least current Soviet capabilities.

But, this is not a valid argument against SALT II. It is as unrealistic to argue for a SALT II agreement that will open up the USSR to US eyes as it is unrealistic to argue that the current SALT II agreement does this now. This simply is not a feasible future. Like it or not, it is not the agreement which will be unverifiable, but Soviet forces, and they will be ever harder to predict. ■☆■

Playing "Pros" and "Cons"

IN BROADER TERMS it is unfortunate that the President has attempted to invest the SALT II agreement with a moral significance which goes far beyond its potential impact, and that his opponents have tried to make the agreement the scapegoat for US strategic inferiority. It is, after all, only a treaty. It is not the cause of the trends in world power and US and Soviet competition, but rather the symptom. It neither binds the US to weakness, nor prevents the USSR from increasing its strength. All it does is establish some fairly broad short-term ground rules for both powers which are based on temporary mutual interests.

The "Pro" and "Con" Game is Not a Valid Basis for Assessing the Treaty

Accordingly, one should not assign too much importance to playing the SALT II "pro" and "con" game. Like verification, the game is a bit phoney, and it certainly suffers from an acute case of tunnel vision. The issue is not whether SALT II is the perfect agreement, but whether it is an acceptable *modus vivendi* given the trends in US and Soviet capabilities with and without such an agreement. Given the trends in the balance, the agreement seems a better basis for the early 1980s than an unlimited and even more uncertain future.

This does not mean, however, that the "pros" and "cons" game can be ignored, and the mix of arguments on both sides is summarized in Table Six. The "cons" are exceedingly important if they are properly recognized as being arguments against US strategic weakness, and the uncertainties in US strategic force improvement plans, rather than arguments against the SALT II agreement *per se*.

The "Cons" Are Really Arguments Against US Strategic Inferiority

Thus, while the "cons" in Table Six do seem to strikingly outweigh the "pros" such an analysis of the merits of SALT II is highly misleading. Most of the "cons" are really complaints about the trends in the balance that fall into one of two extraneous categories:

- First, there is a long list of "cons" which reflects the shift towards US weakness. These, however, are not valid results of the SALT II agreement, but rather of US unwillingness to fund such improvements and implement them. No agreement can be expected to protect the US from the consequences of its plans and budgets, and SALT II does not preclude the US from carrying out the improvements which are necessary.
- Second, most of the other "cons" reflect the fact that the USSR can continue to exploit its vastly superior spending to improve its forces. Again, however, no treaty can be expected to achieve more when the US is committed to negotiating from a position of weakness. If anything, the current agreement probably owes far more to Soviet fears of what the US was than what it is. There is a considerable risk that any effort to renegotiate would simply expose the growing extent of US weakness, the problems in US force improvement plans, and the unwillingness to fund future competition at parity.

Accordingly, the "pros" and "cons" game in Table Six is really an argument against our strategic posture. Playing this game has merit as a rearguard action against our retreat into strategic inferiority, and there is much to be said for trying to use the ratification of SALT II as a lever in such a fight. It should be recognized, however, that such a game is not really a valid argument against the agreement. As Tables Two and Three show, SALT II does what can be done, and beggars can't be choosers. ■☆■

Learning to Live with Strategic Inferiority

THERE IS ENOUGH UNCERTAINTY in these conclusions to hope that the US may yet react more strongly and efficiently. And, that the eight theses supported by these articles may be proved incorrect. Nevertheless, US inferiority is by far the most likely future, and SALT II seems like an acceptable treaty for a bad world.

It is, of course, tempting to pontificate on the factors which have led to this shift to US inferiority; on the problems a liberal democracy faces in competing with a totalitarian and highly militaristic state, and on the general cultural unwillingness in the West to accept the fact that if the USSR continues to spend more, it will get more.

It also sticks in the craw to make such predictions, or argue such a case for SALT II. But, the acceptance of prolonged strategic inferiority is probably the real message behind the FY80 defense budget, and no amount of additional debate over SALT II is likely to change it. Further, defeating SALT II is likely to do little more than make the initial period of transition to inferiority even worse. ■☆■

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