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The Admiral Richard G. Colbert Memorial Prize is a cash award given by the Naval War College Foundation to the author of the best of the professionally worthy essays submitted by a resident student. This, the 1977 prizewinner, argues that the cruise missile is stabilizing, adds an effective element to deterrence, and is an inappropriate arms limitation bargaining chip to squander in order to achieve Backfire Bomber basing restrictions.

STRATEGIC DETERRENCE AND THE CRUISE MISSILE

by

Lieutenant Commander Edward J. Ohlert, U.S. Navy

Nuclear Deterrence Today.

Elements of Deterrent Policy. The introduction of large numbers of deliverable nuclear warheads into the Soviet arsenal engendered a new U.S. foreign policy aimed at the prevention of nuclear war through deterrence. U.S. strategy attempts to integrate strategic weapons *procurement*, proposed *employment methods* (targeting doctrine), and *strategic arms limitation* efforts into a coherent design thus increasing the net security of the nation by reducing the probability that a planned or accidental nuclear war will occur. These interactive elements stimulate, and are stimulated by, counterpart programs within the Soviet Union. While different historical experiences and strategies may mold differing perceptions of nuclear war within each nation, the necessary inter-relationship of their respective strategic elements yields guidelines for evaluation

of procurement alternatives, indicates optimum targeting doctrines to achieve national objectives, and highlights areas for common agreement in arms limitation.

Under the persistent pressure of a vigorous Soviet procurement program, U.S. perceptions of deterrence have evolved from "clear superiority" through "mutual assured destruction" to "flexible response options," ideas expressed largely in terms of refined targeting options. Although changes in Soviet capabilities and U.S. employments imply significant change in mission requirements for the supporting force structure, the realities of weapons procurement—high investment costs and long development times—have resulted in maintaining forces not best suited to present strategy.

The cruise missile, with high pre-launch survivability and usage flexibility simplifies the decision requirements of

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second-strike warfare, making the system better suited to a true flexible response strategy than alternative systems. When deployed in combination with present strategic systems, the cruise missile diversifies the attack modes required of Soviet first-strike attempts, provides better coverage of certain elements of the target structure in a retaliatory strike, and avoids undesired Soviet reactions likely to be provoked by alternative systems.

Given an effective guarantee against the outbreak of nuclear war, the cruise missile contributes to subnuclear deterrence by significantly upgrading the capabilities of present general operating forces in otherwise critically deficient areas and thus provides the United States with a credible response less than nuclear war. The combined contributions to nuclear and conventional forces well suit the requirements of flexible response.

Flexible Response. The massive Soviet strategic arms program that followed the Cuban missile crisis caused Secretary of Defense McNamara to

define "mutual assured destruction"—deterrence through terror with each side possessing the capability to inflict "unacceptable" damage on the opponent even after absorbing a first strike. With nuclear war thus deterred, only conventional war could conceivably occur, and emphasis was given to rebuilding conventional forces of the nation to ensure subnuclear deterrence. The resulting deemphasis of strategic weapons deployment resulted in a steady increase in the relative nuclear power of the Soviet Union (see Table I), nonetheless perceived as nonthreatening as long as "strategic equivalence" was maintained and the Soviet Union could not gain significant advantage in a first strike.

From its inception, however, assured destruction has been beset by a lack of worldwide credibility. European doubts that an American president would condemn U.S. cities in response to an attack on NATO generated pressures for proliferation and a desire that the nuclear deterrence function protecting NATO be autonomous with respect to that covering the United States. This

TABLE I—HISTORICAL CHANGE IN STRENGTH¹

| Year | U.S.A. | | | U.S.S.R. | | |
|------|--------|------|---------|----------|------|---------|
| | ICBM | SLBM | Bombers | ICBM | SLBM | Bombers |
| 1962 | 294 | 144 | 600 | 75 | | 190 |
| 1963 | 424 | 224 | 630 | 100 | 100 | 190 |
| 1964 | 834 | 416 | 630 | 200 | 120 | 190 |
| 1965 | 854 | 496 | 630 | 270 | 120 | 190 |
| 1966 | 904 | 592 | 630 | 300 | 125 | 200 |
| 1967 | 1054 | 656 | 600 | 460 | 130 | 210 |
| 1968 | 1054 | 656 | 545 | 800 | 130 | 150 |
| 1969 | 1054 | 656 | 560 | 1050 | 160 | 150 |
| 1970 | 1054 | 656 | 550 | 1300 | 280 | 150 |
| 1971 | 1054 | 656 | 505 | 1510 | 440 | 140 |
| 1972 | 1054 | 656 | 455 | 1527 | 560 | 140 |
| 1973 | 1054 | 656 | 442 | 1527 | 628 | 140 |
| 1974 | 1054 | 656 | 437 | 1575 | 720 | 140 |
| 1975 | 1054 | 656 | 432 | 1618 | 784 | 135 |

doubt has been mollified only by the continued presence of U.S. troops, introduction of large numbers of tactical nuclear weapons, inclusion of allied planners in targeting decisions at Omaha, and separation of Western Europe from U.S. statements about no first use of nuclear weapons.

A Nixon-Schlesinger reevaluation of the inadequacies of assured destruction resulted in a stated requirement for "flexible response options" which have characterized U.S. deterrence during the 1970s. President Nixon expressed his underlying fears.

Should a President, in the event of nuclear attack, be left with the single option of ordering the mass destruction of enemy civilians, in the face of the certainty that it would be followed by the mass slaughter of Americans?²

The major goals of flexible response are

1. To deter a broad range of Soviet military options;
2. To provide incentive and demonstrate U.S. capability to limit war should deterrence fail;
3. To permit continued negotiation even after the commencement of hostilities;
4. To terminate hostilities on terms acceptable to the United States and her allies.

A long sought entrant into U.S. nuclear policy is strategic arms limitation. The high cost of weapons systems, the dangerously unsettling effect of rapidly accelerating weapons technology on world stability, and the unpredictability of result (both in terms of system performance and net security improvement) created a desire to "cap the arms race"—limiting the amount expended on weaponry that one hopes will never be

used. The Anti-Ballistic Missile Treaty, Nuclear Non-Proliferation Treaty, Interim Offensive Agreement (SALT I), Vladivostok Understanding of 1974, Peaceful Nuclear Explosion Treaty, Threshold Test Ban Treaty, and Environmental Modification Treaty are present agreements resulting from strategic arms limitation efforts.³

Strategic Asymmetries. The United States and the Soviet Union have not shared identical experiences, nor do they have identical political, military, or cultural characteristics. These asymmetries foster differences in the perceptions of each nation about the relevance of nuclear war to foreign policy, the probable course of war should it occur, and the necessary composition of force structures.

The government of the Soviet Union draws much of its legitimacy from continued primacy in the international Communist movement. Loss of leadership to China or any other nation would remove the basis for Soviet claims to authority and could affect the internal stability of the clique in power if not of the government as a whole. Détente, while reducing direct tension between the Soviet Union and the United States, could not imply an end of support for conversion of nations to communism. Brezhnev's statements in support of continued "wars of liberation" and Soviet efforts in Africa attest to the continued vitality of Soviet expansionism. As the party seeking change, the Soviet Union has the advantage of choosing the time, place, and intensity of confrontation.

Earlier "uprisings" in Hungary, Czechoslovakia, and incidents in Poland and the Soviet Union indicate that "population control" is a more serious problem for the Kremlin than for the West. While one party within a Western country may lose its popular support, there are few instances where there is little support for the type of govern-

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ment. Nor are U.S. troops present in NATO countries against the desires of the host population. The stability of Pact governments, and the continued basing of Soviet troops, requires formal police control and military occupation. The ability of the Soviets to commit presently deployed troops to a mobile front war of uncertain outcome is impaired as unexpected reverses with extended logistic lines might well encourage insurgency among their allies. Further, with dual tasking for occupation troops, larger forces would be required.

While the Soviet Union is at a serious disadvantage in access to open ocean, her land position confers compensating advantages. Soviet industry is connected to its resources, and her allies to her industry, by relatively invulnerable land transport. Road and rail routes are "hard" targets and easily repairable. U.S. sea lines of communication are vulnerable to open ocean interdiction, terminal blockade by SSNs and mines, and destruction of terminal facilities. Thus, isolated from natural resources and probable areas of conflict, U.S. industry will be unable to contribute to an allied war effort until the end of nuclear hostilities permits rebuilding ports and airfields. Interior land lines of communication will favor the Soviet Union in a long war, while the NATO countries will be unable to commence economic recovery until the Soviets permit terminal restoration.

The proximity of NATO allies to forward-deployed Soviet ground forces renders them vulnerable to a rapid investment which would complicate targeting the invaders without sustaining significant collateral damage. Seizure of populated NATO industrial areas represents a nontargetable prize the equivalent of which is not available to Western planners. Concentration of Western industry and population increases their vulnerability (particularly in the absence of civil defense). The natural dispersion

of Soviet population and the forced dispersion of industry complicates targeting Soviet economic recovery capabilities. Such targeting favors the Soviet Union more than the United States, and the Soviet Union has an economic "fallback" position in seizing border countries whereas the United States does not.⁴

Past national experience may be expected to affect strategic thought. The United States, isolated from 20th-century land conflict by the oceans, has not suffered severe population losses. Russia, on the other hand, has a long history of wars fought on her soil at high cost in individual lives. (Further, the Soviets have sacrificed millions of lives in execution of domestic policy.) Thus, history has demonstrated to the Russians that war extracts a high price in Russian lives—but a price that Russian and Soviet governments have been willing to pay. Soviet damage limitation efforts may be interpreted as an attempt to ensure that there will be no more Leningrads, while the United States' preoccupation with preventing surprise attack may well stem from the Pearl Harbor experience. Further the United States long enjoyed a nuclear superiority that permitted nuclear war to be pushed out of mind as too terrible for consideration. The Soviet Union has been forced to consider foreign policy ventures in terms of the impact of an oft-threatened massive retaliation. The Cuban missile crisis of 1962 appears to have been the catalyst for a procurement program that generated the present force structure. The combination of these national experiences directly affects the basic premise of mutual assured destruction—the guaranteed ability to inflict unacceptable damage on valued items. *Unacceptable* must be correctly defined, and the opponent must *value* the target items. The United States' assignment of unacceptableity represents a curious crossing of cultural bounds, and while

historical evidence (the dismantling of German factories) supports high Soviet regard for industry, there is little to indicate that the loss of unskilled population is too high a price to pay in the furtherance of either foreign or domestic policy.⁵ Not only is it a speculation for the United States to presume deterrence by the prospect of losses the Soviets consider unacceptable, but Soviet civil defense programs and industrial dispersion eventually will blunt U.S. countervalue capability.

The force structures of the United States and the Soviet Union vary more widely than can be explained by technological lag. In 1976, the Soviets had deployed 2,342 warheads of 1 megaton or greater, while the United States had deployed less than 800. Many of these Soviet warheads were post-1975 systems with accuracy and yield efficiencies adequate for the hardest industrial target. Soviet procurement programs remain active long after U.S. ICBM production has ceased (the United States has maintained 1,054 ICBMs since 1967), and Soviet deployments outnumber those of the United States significantly. Greater throw-weights, improving accuracy, and more efficient yields characterize a Soviet strategic rocket force inappropriate to "city-busting" in a countervalue strike.⁶ Soviet procurements are plainly guided by mission requirements other than those of mutual assured destruction.

In summary, international Communist competitions force Soviet leaders to be expansionist. Limitations on conventional forces restrict their use and tie them closely to nuclear forces. While the United States postulates that the use of nuclear weapons will be in last resort, the Soviets view them as the spearhead for conventional forces. Targeting against economic recovery most threatens the United States, and American force structure is designed for such a strike. A counterforce strike most threatens the Soviet Union, and Russian

weapons have counterforce characteristics. The strategic objectives of the two nations appear different.⁷

While the United States views nuclear war as totally undesirable, and U.S. policy is actually one of war avoidance, the Soviets view nuclear war in a traditionally Clausewitzian sense.

The attempt of certain bourgeois ideologists to prove that nuclear missile weapons lead war outside the framework of policy and that nuclear war moves beyond the control of policy, ceases to be an instrument of policy and does not constitute its continuation is theoretically incorrect and politically reactionary . . . immeasurably more effective means of struggle are now at the direct disposal of state power.⁸

Strategic Cruise Missiles. To implement its deterrent policy and guarantee long-term stability, the United States has maintained a force structure composed of three major elements—land-based ICBMs, submarine launched ballistic missiles, and manned intercontinental bombers. The combined characteristics of these systems are intended to

1. render simultaneous first strike upon them impossible;
2. provide a capability for striking required targets;
3. ensure that a technological breakthrough does not simultaneously neutralize all systems.

System characteristics for any individual element of such a system are that it must be *survivable*, capable of delivering a warhead to a target, *flexible* to permit use against a variety of targets, and it must be *efficient* if it is employed. If the cruise missile is to be considered a procurement candidate, it must be judged on these characteristics.

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only on very important targets that are sure to be destroyed by the expenditure.

With the use of MIRV weaponry, the decision tree is more complex. As Soviet reserve force elements are detected, a value judgment is made justifying expenditure. Next, judgment must be made as to the time sensitivity of the target (e.g., mobile and escaping, or in firing readiness). If it is time sensitive and valuable, a MIRVed missile must be expended on it, thus wasting the warheads not required for its destruction. If the target is not time sensitive or its value does not justify the expenditure of an entire missile, the target is placed into a queue. With targets being detected throughout the world, the responsibility area of each queue must continuously be determined via a mapping function which maximizes the number of targets within the footprint of the delivery vehicle. When an area queue is filled, a MIRVed missile may be expended on it, efficiently using each warhead in the destruction of a valuable target. Queue management is an extremely complex process requiring re-mapping and reevaluation of the summation of target values in the queue with each new target discovery. This process consumes more time than the decision process for single warhead weaponry, and requires greater capabilities in sustained surveillance, command and control. Extensive computer support is required for queue managers. If Soviet counterbattery capability for backtracking along the course of a missile to localize the firing platform (e.g., a submerged submarine) is suspected, an additional decision must compare the value of all warheads onboard against the targets in a single queue. Alternatively, the size of the queue assigned to a multitube platform may be expanded by targeting every warhead onboard and conducting a rapid complete fireout when the queue is filled. This further increases the time

from detection to attack and again burdens sensor systems with a tracking problem and data renewal requirements. To grasp the resulting control problem, consider a *Trident* submarine loaded with 24 missiles, each carrying 14 warheads. For optimal fireout with one warhead per target (some targets may, however, require additional warheads to achieve an acceptable kill probability) 336 targets must be detected and tracked. Then integrate the *Trident* into the national decision structure with other *Tridents*, Minutemen, bombers, etc. Clearly this is an immense problem to consider, let alone solve optimally. Computer size considerations indicate that this type of war, with MIRV weaponry, cannot be fought from an airborne command post and can be fought from ground-based command centers only if surveillance feedback and high data rate communications survive. Yet, with a nuclear force significantly reduced by a Soviet first strike, failure to use every surviving warhead to maximum efficiency will lower the postwar relative power of the United States versus the Soviet Union and degrade chances of achieving an acceptable settlement. The strong implication is that if the United States should find itself in a nuclear war in the near future, it will be armed with weapons ill-suited to the decision requirements of such war.

Theater Nuclear Weapons. Present stockage of theater nuclear weapons in Europe has created concern for their vulnerability to assault or sabotage. The range of the cruise missile will permit its emplacement in more secure, but tactically ready sites.

Tactical Cruise Missiles. Under any effective guarantee of nuclear deterrence, conventional forces assume increased importance in preventing lower order conflict not credibly deterred by nuclear threats. The cruise missile,

conventionally armed, complements present land and naval general purpose forces, and contributes to subnuclear deterrence.

Use Modes. There are three general categories of conventional usage of the capabilities represented by the long-range cruise missile;

1. strike of fixed site point or area targets;
2. strike of mobile targets acquired by onboard guidance systems;
3. forward pass of ordnance from a "storage" platform to a controlling or designating agent.

Striking fixed position targets requires prior intelligence or a targeting loop with supporting reconnaissance and communication facilities. Examples of targets in this category include headquarters facilities, communication sites, ammunition depots, fuel dumps, bridges, rail and road freight transfer points, pipe or electrical line energy supply, troop and armor formations, and routes of imminent passage. Not all of these targets are amenable to attack by warheads presently under consideration and define a need for area coverage as well as point target destruction.

Striking mobile targets acquired by onboard guidance is best illustrated by the proposed sea version of Tomahawk which is capable of terminal guidance against shipping. Development of a similar capability for acquisition ashore would permit striking land mobile targets within a wide geographic area. Moving trains, mobile SAMs and tracked armor or artillery are targets in this category.

Forward pass of ordnance to a user from a central storage point would seem to be the category of greatest promise for cruise missile variants. Delivery on

call or time schedule to forward deployed missile controllers would permit heavy ordnance delivery by light infiltration teams on land. Delivery of mid-course controllable ordnance would permit replenishing forward platforms without requiring their return for rearm. For example, airborne combat air patrol aircraft defending against a large Backfire raid will rapidly expend their air-to-air missiles. Launching additional aircraft may not be possible if the carrier deck is being respotted or has sustained battle damage. Given the speed of the Backfire and its missiles, there may be insufficient time for a deck-launched interceptor to gain a firing solution. The loiter characteristics of the cruise missile (or a recoverable variant) would permit "busing" additional air-to-air missiles from a picket ship to F-14 aircraft for their automatic control during peak threat times or high intensity engagement.

Cruise missiles under local control could precede a manned aircraft strike, reducing the threat to aircraft penetration. Missions of potentially high attrition could be assigned to cruise missiles, sparing aircraft assets for missions requiring greater flexibility. The presence of cruise missiles within a strike group would multiply the targets that must be acquired by the opposing air defense net, contributing to saturation. The low payload characteristics of V/STOL aircraft might be given some relief by requiring only that the aircraft carry missile control equipment and use forward passed ordnance upon arrival at the target. Systems already in advanced development will add to the potential uses of the cruise missile or complement the system in the forward pass mode. Advanced Multipurpose Missiles, Copperhead and Hellfire, Ground Laser Locator-Designator antiarmor systems, Remotely Monitored Battlefield Sensor Systems, and Standoff Acquisition systems are a few programs with potential contributions.⁹

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Specific Deficiencies Aided by Cruise Missiles. Cruise missile systems may significantly restore credibility to conventional deterrence in the Central Front area of Europe. As mentioned previously, the potential exists for rapid investment of Soviet ground forces into fallout sensitive areas within allied nations. The low collateral damage of the conventionally armed cruise missile will permit targeting in such circumstances. The presently perceived threat of a rapid armor/mobile infantry thrust into Europe diminishes when one considers that all known Soviet fuel depots, ammunition storage sites, transportation nets, communication sites and even headquarters could be struck by accurate, low-flying cruise missiles within 2 hours of the outbreak of hostilities. Routes of advance—even in unexpected directions—could be mined and forward Soviet units delayed or isolated from supply and reinforcement. Present Army tactics call for a zone of attrition to reduce the Soviet impact upon arrival at a main battleline. Attrition teams need only be armed with target designers and communications equipment, unhampering their mobility and allowing them to remain undetected.

Declining naval gunfire capability in the face of sophisticated defenses has thrown the amphibious mission of the Marine Corps into some question. The strategic importance of areas such as Iceland and Denmark imply that the requirement for amphibious capability has not declined. Destruction of fixed site targets and the forward passing of ordnance to infiltration teams will reduce the enemy's ability to oppose a major assault. The rapid all-weather availability of cruise missiles may restore some of the responsiveness in supporting fire not available from carrier-based air. Owing to its low trajectory, naval gunfire is unable to engage defiladed targets, while the cruise missile with terrain-following capability does not share this disadvantage.

Platforms for at-sea carriage of the cruise missile can be the escorts for the high value unit, thus decentralizing a portion of the projection power of the carrier task force. The multiplicity of targets within any task force capable of an offensive role will force the Soviets to attack all units, thus diffusing the forces opposing the carrier task group. Given present prehostilities rules of engagement for a carrier in a high threat environment, the first engagement of U.S.-Soviet naval forces is likely to be followed by an attempt to extract a damaged carrier after it has been struck preemptively. The offensive strike power of the escorts then would be critical to carrier survival.

Cost Considerations. While the cruise missile may be viewed as an expensive system, there are significant efficiencies which reduce the life cycle costs of the system.¹⁰ Its employment may free expensive aircraft from high attrition missions, and preclude destruction of otherwise vulnerable NATO forces.

Package deployment and central stockage will reduce maintenance costs compared to alternative systems. Training requirements are small compared to pilot training, and recoverable missiles may be used. The long range of the system permits an area defense rather than prepositioning at several forward points—some of which might be vulnerable to enemy interdiction and others out of the area of conflict. As in the nuclear area, Soviet counters to the conventional warhead cruise missile will likely include defense upgrading, which will reduce funds available for offensive investment, thereby lessening the defensive requirements of NATO.

The rapid response of the system against the logistics of a major attack on NATO will permit stabilization times measured in hours instead of days, thereby saving territory and equipment from destruction and enhancing NATO counteroffensive capability.

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High threat operating areas impose unacceptable attrition rates on manned aircraft. Missions demanding flexibility and an onscene decisionmaker will require that aviation assets be husbanded. Cruise missiles, remotely piloted vehicles, and manned aircraft complement each other in a cost/capability spectrum that dictates roles for each. Thus, high attrition missions requiring low flexibility are best handled by a cruise missile, while low attrition high flexibility missions are best handled by manned aircraft.

Summary. The very large force structures deployed by both the Soviet Union and the United States cannot be justified solely on the basis of guaranteeing the assured destruction of a percentage of the enemy's population and industrial base. The survival of only a few warheads would accomplish this relatively simple task. Only the desire to guarantee that, in postwar conditions, the opponent does not have sufficient unopposed reserve nuclear forces to conquer the world accounts for the large numbers. In a deterrent strategy based primarily upon demonstrated capability to reestablish strategic equivalence, the cruise missile demonstrates "war-fighting" characteristics superior to MIRVed systems. Inflight vulnerability of the cruise missile will require coordinated tactics for its use with other strategic elements, and second-strike ad hoc targeting of reserve nuclear elements will require substantial reconnaissance and communications support.

The prelaunch survival characteristics of the cruise missile, in the tradition of the present members of the TRIAD, demand that it be attacked by means that can not take advantage of surprise. The difficulty of coordinating an attack on all elements of a QUADRIGA will reduce further the possibility of surprise nuclear war.

Likely Soviet response to the cruise missile involves a buildup of conven-

tional forces, representing a diversion of assets from fallout-producing ICBMs. An improved Soviet defensive capability will permit the Soviet decisionmaker more time for consideration in a crisis and aid in relieving him from a decision to "go nuclear" early in a crisis to avoid elimination of his force structure.

The cruise missile will contribute to subnuclear deterrence by upgrading general force capabilities and by providing a conventional warhead able to perform previously nuclear missions, thus raising the nuclear threshold.

The cruise missile represents the ideal in offensive weaponry for a second-strike-oriented nation. Its slow flight speeds preclude its use as a first-strike weapon, while its high prelaunch survivability deters an opponent's first-fire decision. Further development of highly survivable offensive systems coupled with treaty-mandated defensive development may permit restoration of the dominance of policy over strategy in nuclear warfare, area for maneuver for statesmen, and initiation of a national policy of mutual assured survival.

Conclusions.

—Deterrence under flexible response is achieved by ensuring that the Soviet Union does not have an attractive nuclear option in attacking the United States. Rather than the assured ability to destroy Soviet cities, an assured ability to reestablish strategic equivalence on second strike better accounts for U.S. procurements.

—This deterrent strategy mandates that a weapon system be survivable, capable, flexible and efficient. MIRVed systems complicate the decision requirements of second-strike warfare while single warhead systems lead to a form of decision efficiency critical to optimum use of strategic assets.

—The cruise missile is "stabilizing" in that its slow flight time precludes first-strike use and its conventional

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capability permits a delay in the decision to "go nuclear" for lack of adequate conventional response.

—Over-the-horizon targeting and wartime control dictate requirements for complementary system development, particularly in reconnaissance, data processing, communications and control.

—The cruise missile will contribute to nuclear deterrence, add an effective element to TRIAD, and contribute to subnuclear deterrence, augmenting existing general purpose forces.

—If the cruise missile is to be restricted through arms limitations, a more commensurate trade than proposed backfire basing restrictions (easily violated in crisis) is appropriate.

—Given the active cruise missile development programs of several nations, U.S. unilateral restraint in developing and deploying cruise missiles will remain unilateral.

BIOGRAPHIC SUMMARY



Following his graduation from the U.S. Naval Academy in 1966, Lieutenant Commander Ohlert served in several electronics and weapons associated billets in VA-34, VA-72, and U.S.S. *Oriskany*. He

received an advanced degree in Electronics from the Naval Postgraduate School in 1974 and was a student at the Naval War College in 1976-77. He is now assigned to VA-82.

NOTES

1. *The Military Balance 1975-1976* (London: International Institute for Strategic Studies, 1976), p. 73. Note that the capability of a force structure is composed of many elements—numbers of launchers being only one measure. In general, Soviet missiles have larger payloads and less accuracy than U.S. systems. Fewer are MIRVed. Technological gains permitting greater accuracy, efficient MIRVing, and improved-yield warheads will further accentuate the trend highlighted by Table I.

2. James R. Schlesinger, *Annual Defense Department Report, Fiscal Year 1975* (Washington: U.S. Govt. Print. Off., 1974), p. 35.

3. Donald Rumsfeld, *Annual Defense Department Report, Fiscal Year 1978* (Washington: U.S. Govt. Print. Off., 1977), pp. 49-50.

4. Henry Young discusses the economic incentives facing Communist leadership in crisis in the November 1976 Naval Institute *Proceedings* article "Holocaust for Happy Valley."

5. Secretary of Defense McNamara indicated that 20-25 percent population kill and destruction of 75 percent of Soviet industry would constitute unacceptable damage. A 20 percent population kill, 40 million persons, would approximately equal the Russian losses in World War II and the purges combined. Recent studies of the Soviet civil defense program, however, question the ability to kill more than approximately 13 million—less than either World War II or the purges, thus challenging the term "unacceptable."

6. Better area coverage of a "soft" urban target can be achieved by a number of small warheads than by a single large warhead. Accuracy is required only if one wishes to strike a specific portion of the urban area and minimize collateral damage. "Hard" targets, such as ICBM silos, are better struck with accurate large yield warheads. While large yield warheads on older systems may be interpreted as an attempt to overcome inaccurate guidance, large warheads on modern accurate systems indicate that counterforce is their intended use.

7. U.S. intelligence agencies noted the apparent disparity in objectives and characterized Soviet strategy as "war winning." Presently deployed Soviet capabilities do not warrant characterization as beyond war survival or damage limitation; however, this is perhaps a narrow distinction as a war-fighting capability is essential to each of these strategies. Continued Soviet counterforce deployments will lend credence to the consideration that their goal is a war-winning capability.

8. "Communist of the Armed Forces" as quoted in *Soviet World Outlook* (Washington, D.C.: University of Miami Center for International Studies, 13 February 1976).

9. Rumsfeld, pp. 167-168.

10. Secretary Brown's comments following President Carter's June decision on the B-1/Cruise missile program are given in *Naval War College Review*, Vol. 31, No. 2, p. 52.