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Long-Term Competition with the Soviets: A Framework for Strategic Analysis (U)

A. W. Marshall

A Report prepared for
UNITED STATES AIR FORCE PROJECT RAND

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PREFACE (U)

(U) This report presents and argues the case for a new framework for U.S. strategic analysis. The rationale is that since the United States is at present in an extended strategic arms competition with the Soviet Union, it should assess the nature of the competition, clarify its national goals, and seek to be a strong competitor. One benefit from studying aspects of the long-term arms competition would be a better insight into the nature of the interaction process between U.S. and Soviet strategic force postures.

(U) This material is a product of Rand's study of new doctrine and strategies for strategic forces. It is part of a program of work agreed to in discussions with the Project Rand Air Force Advisory Group in January 1971. It should be particularly useful to officers in the Directorates of Plans and Doctrine, Concepts and Objectives, Hq. USAF, and others involved in the generation and analysis of Air Force programs in the strategic forces area.

SUMMARY (U)

(U) A new framework for strategic analysis is presented and argued for. The suggested framework follows from the belief that:

1. The United States is now, and will continue to be, in an extended, continuing strategic arms competition with the Soviet Union, irrespective of the outcome of the current SALT negotiations.
2. This continuing competition is essentially inevitable, although its character can be controlled to some extent by arms control agreements, and more particularly by the way the United States conducts itself in the competition.
3. The United States should therefore
 - o Assess the nature of the strategic arms competition, in part to see if the above assumptions are valid.
 - o Clarify U.S. goals in that competition.
 - o Develop a strategy for competing effectively.

(U) The development of a framework for strategic analysis based upon this approach could significantly assist the Air Force in generating and analyzing programs to improve the U.S. strategic force posture. The main payoffs would be:

1. It would help rebut current arguments against certain programs that focus almost entirely upon stability in the "arms race" as the dominant U.S. goal in force posture design.
2. It would provide a sound basis for the development of improved policies for R&D and procurement related to U.S. strategic forces.
3. It would, through the focus upon the long-term competition, raise an issue of great importance: How well is the United States doing in that competition with the Soviets? With what efficiency are U.S. strategic forces being produced?

The United States may be pricing itself out of this competition, or at least severely handicapping itself. If this is true, an early and accurate assessment of the underlying problems is vital.

Developing a new and somewhat different way of looking at the problem of designing U.S. strategic forces will not be easy. Defending it and convincing others of its advantages will take time. A shift in the framework of strategic analysis, and perhaps in U.S. policy, would be effective only if it also led to the development of new methods of analysis and new design criteria for force posture planning.

(U) Despite the extensive literature on arms control, arms races, and action-reaction phenomena, there is a lack of well-developed models of the strategic arms competition. Commonly used hypotheses about the nature of the strategic arms race, or about the U.S.-Soviet interaction process (claiming a closely coupled joint evolution of U.S. and Soviet force postures), are either demonstrably false or highly suspect. The more serious classified studies of the interaction process almost uniformly present a picture of a much more complex, slower moving action-interaction process than that asserted by arms control advocates.

(U) A consensus as to appropriate U.S. goals for the long-term competition could emerge only from an energetic process of discussion and argument among a wide range of people and organizations within the U.S. government. Some likely U.S. goals are as follows:

1. To provide strategic forces that for the foreseeable future will satisfy national military objectives. These objectives include:
 - o Deterrence of nuclear attack upon the United States.
 - o Deterrence of attack upon U.S. allies.
 - o Capabilities for limited and flexible strategic operations.
2. To control and guide the strategic arms competition.
 - a. Control the character of the competition:
 - o Maintain stability.
 - o Provide consistency with arms control agreements.

- b. Attain long-term goals in the competition:
 - o Steer toward postures that minimize the chance of accidental war or rapid escalation, and so on.
 - o Limit nuclear proliferation.
- c. Maintain an effective, efficient U.S. competitive role:
 - o Improve U.S. efficiency.
 - o Complicate Soviet problems of maintaining competitive positions.

(U) Assuming that the United States is in a long, continuing strategic arms competition, what should its strategy be? Until goals are more clearly agreed upon, it is difficult to say. But clearly there are many goals, and whatever they are, both sides compete within a number of constraints: relatively fixed resources over any short period of time and numerous complications in internal decisionmaking processes that slow and diffuse reactions to the opponent's moves or to new technological opportunities and generally limit the efficiency with which resources are used. Because the competition will endure, considerations with mainly long-term payoffs must enter into formulation of the strategy. Ultimately, detailed U.S. strategy should be specific to particular areas of decisionmaking -- for example, basic technology development, weapon systems R&D, force posture programming, retrofitting, and short feedback tactical reaction to developments in Soviet force postures.

(U) The Soviets are closing the military R&D gap, probably one of their top goals since World War II. Previously the United States could support a policy of staying ahead in all of the areas of technology it cared most about. The list has to be smaller now, and the United States may need a new R&D strategy. What are the comparative R&D costs of being a leader or a follower in specific technology areas? Where can the United States most effectively allow the Soviets to lead? Can the United States save money by doing so? Where should the United States try to stay ahead? Where should it be trying to build new areas of comparative advantage through expanded or new R&D programs?

(U) To some extent the United States can probably force increased expenditures on the Soviet Union in specific areas, thus preventing their fixed resources from being spent on other things that may be more threatening to the United States. Once one begins to think in terms of what U.S. strategy should be for the long-term strategic arms competition, it is natural to adopt a point of view that contrasts with current force posture planning analyses. One asks: What are the areas of technology, of military operations, and so on where the United States has an advantage? What problems do the Soviets have? How can the United States move the competition into areas where it has an advantage, or the Soviets a disadvantage? Force planning is seen as balancing of risks and advantages in the allocation of U.S. resources among programs and areas.

(U) The Soviet Union has overtaken the United States in the strategic area as regards the size of forces and genuine level of resources expended (although there are obvious problems in making the latter comparison). Continuation of force-posture analysis procedures developed when the United States was far ahead becomes doubly crippling. The U.S. planners have at any period of time essentially fixed resources to use in producing strategic forces; if they spend lavishly for high-cost hedges against possible but unlikely developments, resources will soon be exhausted. At that point the United States will have less than needed to spend on higher-probability contingencies, or on moves that might complicate Soviet problems. If the question of where U.S. advantages lie is never addressed, how can the Soviets be forced to spend resources in areas where they are at a disadvantage? The United States is not being an effective competitor now. U.S. strategy must emphasize U.S. advantages. Better risk balancing is essential to the efficient use of resources. The United States has to be as good as or better than its opponent in the effectiveness with which resources are used, now that the Soviets are spending comparable resources.

(U) A good competitor, for example, does not allow his opponent unilaterally to develop a hard-target kill capability, forgoing the

development of comparable capabilities (for even part of his force) in the hope that this restraint will induce the opponent to limit his program. If one does restrain oneself this way, the effect in the long run is to reduce the comparative effectiveness with which he uses his resources. The opponent's hard-target kill capability may force expensive countermeasures (while the opponent may escape similar expenditures), or it may force the threatened system to be abandoned, with loss of accumulated investment. Stability is a U.S. goal, but not the only one. Over the long run the United States cannot allow its opponent to consistently use his resources more effectively.

(U) It is difficult to predict exactly what sorts of changes in analytical methods, or in inputs to analysis, would be required to implement an approach to force posture planning focused upon implementing a strategy for the attainment of U.S. goals in a long-term strategic arms competition. The following appear to be important areas of analysis for further development:

1. Force posture planning gaming should be explored as a major tool of analysis. This form of posture planning analysis would allow use of the complex criteria required to test proposed force posture programs. The gaming format highlights the joint evolution of the two force postures and associated programs through time, producing an awareness of problems and constraints on both sides, as well as of the interaction process.
2. Much development effort has gone into techniques for decision-making under uncertainty. In particular, Bayesian methods, which allow improved risk balancing, producing prudent rather than excessive conservatism are of obvious interest.
3. Some changes in intelligence estimates will be required for an appropriate presentation of alternative Soviet force posture trends and to incorporate improved models of Soviet decisionmaking processes. More account must be taken of the fact that Soviet force posture emerges, as does that of the

United States, from a complex decisionmaking process involving many organizations with conflicting goals.

4. Improved methods for making net assessments are desirable. A key aspect of decisionmaking, or the implementation of a U.S. strategy for the strategic arms competition, will be a constant monitoring of how the United States is doing relative to the Soviets.

(U) The most promising near-term payoffs appear to be to:

1. Undertake substantive studies of such key areas as:
 - o The history of the strategic arms competition since World War II.
 - o The nature of the interaction process between U.S. and Soviet strategic force postures, leading to the development of more sophisticated hypotheses and models of that process.
2. Develop the argument for the inevitability of the continuing long-term strategic force posture competition if, as expected, studies of the history of the strategic arms competition support initial conjectures. Although most readers of this report would agree that such a continuing competition is almost inevitable, it will be important to make the case to a wider audience.
3. Make well-articulated formulations of U.S. goals for a long-term strategic arms competition. This is undoubtedly a key area with a big payoff, both in clarifying U.S. objectives in the competition and in providing a framework for arguing against those who stress a single U.S. goal, or only a few goals. There are multiple goals and tradeoffs required among them. Moreover, if it is granted that the United States is in a long-term competition with the Soviets, one U.S. objective is to be an effective, efficient competitor.

In the longer term -- where payoffs are no less important -- studies of somewhat greater analytical depth can be designed to provide the

means for implementing a U.S. strategy for the strategic arms competition through the appropriate design of force posture programs, detailed policies for R&D, and so on. These include the development of new analytical methods to include:

- o Bayesian methodology for improved risk balancing.
- o Force posture gaming techniques.
- o Net assessment methodology.
- o Improved intelligence estimates.

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I. INTRODUCTION (U)

(U) This report proposes a new framework for strategic analysis, argues its merits, and suggests potential payoffs to the nation from developing this framework. The proposed framework for strategic analysis centers on the long-term U.S. strategic arms competition with the Soviet Union. This competition will continue, whatever the outcome of the SALT talks, although its character can be controlled to some extent by arms control measures and by the way in which the United States conducts itself in the competition. In some sense the United States wants to do well in, or at least not lose, this competition. What then should be its strategy, or policy? How can it compete effectively and efficiently? The strategy chosen for the competition would guide decisions affecting the future evolution of U.S. strategic forces.

(U) This new framework for strategic analysis could have substantial payoffs:

1. It would provide a sound and realistic way of looking at the problem of designing U.S. strategic force posture programs. Recent Presidential foreign policy statements reflect an awareness of the inadequacy of the current framework and approach to U.S. force posture programs. There is a need for an alternative.
2. It would provide an improved, explicit basis for dealing with issues of arms control and arms race stability. The arms race and stability issue, for example, needs to be met head on; existing data suggest that the problem is overstated. But stability of arms competition is only one of several national goals in the long-term competition. Stability has to be traded off against other objectives. A framework within which such trade-offs can be made is needed. At present, the arms control and force planning decision processes are too separated.
3. It would raise an issue of great importance: Can the United States efficiently compete with the Soviet Union in the production, deployment, and operation of strategic forces? There is a growing concern that the United

States is pricing itself out of this competition, or at least severely handicapping itself.¹

(U) Developing and gaining acceptance for a new framework of strategic analysis will not be easy. Changing people's minds, or ways of thinking about problems, takes time. Moreover, there are difficult problems of implementation, discussed below. But within a year, studies on specific aspects of the long-term competition could produce useful outputs. In particular, studies of the history of the strategic arms competition, of the nature of the U.S.-Soviet strategic arms interaction process, and of U.S. goals in the strategic arms competition would help to show (1) that the arms competition is not so unstable as most arms control advocates and others indicate, (2) that the interaction process is much more complex and slow-acting than usually believed, (3) that there is a multiplicity of actual and legitimate U.S. goals in the strategic arms competition, and (4) that compromise among them is unavoidable. Full implementation of this framework of analysis, as a practical way of planning and programming U.S. strategic forces, would require changes in analytical and other techniques.² The development of new techniques and improved decision inputs would undoubtedly take several years.

(U) All of this anticipates some of the conclusions that are drawn at the end of the report. But it is appropriate to bring out

¹(U) There are two different but related ways in which one may price oneself out of the competition. First, because of low near-term budget prospects and the high per-unit cost of the next generation of major equipment items, it may be impossible to buy equipment in sufficient numbers to supply current needs. Second, one may have to cope with the longer-term, more pervasive effects of a continuing disadvantage in the economics of producing military forces.

²(U) The assured-destruction-only view is strong now, not only because many people are intellectually convinced that it is an appropriate criterion for the design of U.S. strategic force postures, but because it has behind it 20 years of development of appropriate analytical tools. The force exchange calculations required are now easily (if not always thoughtfully) made. Thus, even if the general intellectual framework shifts but nothing happens to replace these analytical tools, assured-destruction-only or something like it may dominate formal analysis for many years to come.

here the magnitude of the task involved in fully implementing a major change in the framework of analysis of U.S. strategic forces.

(U) The strategic arms competition is, of course, only one part of a much wider competition in which the United States is engaged with the Soviet Union. This wider competition involves not only military forces but also political, economic, and cultural ones.¹ These other aspects of the competition are largely ignored in what follows, but some of them have major relevance, particularly those related to factors that influence the efficiency and effectiveness with which the United States is able to produce strategic forces. Over the long term, the comparative military economics of the United States and the Soviet Union are extremely important.

(U) The years ahead are likely to be a time of re-evaluation of U.S. policy in many areas affecting the continuing competition with the Soviet Union. The balance of strategic forces has changed dramatically in the past few years, and some decisions as to future U.S. policy will have to be made. SALT negotiations are going on and their outcome is uncertain. Promulgation of the Nixon Doctrine is evidence of a shift in U.S. foreign policy objectives. Military budgets are likely to be constrained, and the escalation of weapon and manpower costs indicates a declining military expenditure in real terms. All in all, it is time for a re-thinking of U.S. military policy.

(U) A natural sequence of steps in the development of a policy, or strategy, for the long-term strategic arms competition is the following:

1. Characterization of the nature of the competition.
2. Delineation of U.S. goals in the competition.
3. Development of an appropriate strategy, or strategies, for achieving these goals.

¹(U) For an appreciation of these aspects of the competition, see H. Goldhamer, The Soviet Union in a Period of Strategic Parity, R-889-PR, The Rand Corporation, November 1971.

4. Development of analytical methods and modification of inputs required to design and program U.S. strategic forces in accordance with this strategy.

The rest of the report follows this sequence. At the end of the report is a section describing what appear to be the most useful areas for future work.

II. THE NATURE OF THE LONG-TERM STRATEGIC ARMS
COMPETITION WITH THE SOVIETS (U)

IS CONTINUED COMPETITION IN STRATEGIC ARMS INEVITABLE? (U)

(U) Most readers will agree that continued, substantial competition is inevitable. Prospective SALT agreements probably will not cut off further relevant R&D, since no effective verification program is possible. The Soviet military R&D establishment has been growing steadily, for a long time, and it is unlikely that it would be abruptly shut off, or even reduced in any significant way, even should there be a far-reaching SALT agreement. The Soviet R&D establishment can be counted on to continue to produce new technology and new weapons options in the strategic forces area. The United States for its part will have to maintain a substantial R&D program as a hedge and a basis for understanding information acquired on Soviet programs.

(U) In any case, the general evolution of technology would produce new options for strategic forces, even though not focused on military problems. Moreover the Strategic Rocket Forces and the PVO (Soviet Air Defense Forces) are strongly entrenched parts of the Soviet military bureaucracy; they will continue to press for the deployment of new weaponry. Both appear to be successful in obtaining large portions of Soviet military expenditures -- and they probably will continue to be so. The continued growth of the Soviet ballistic missile submarine program seems assured. No prospective SALT agreement seems likely to do more than stabilize or slow the rate of growth of Soviet expenditures on strategic weapons programs.

(U) Arms control advocates do not come out clearly on the issue of the inevitability of continued strategic arms competition, or the level at which the competition can be stabilized. Some appear to hope for restraint in the further development of strategic weapon technology once an agreement is reached as to force size. Others apparently hope that the Soviet Union will attain parity and curtail further efforts to develop its strategic forces. Still others undoubtedly hope that the Soviets will move on to arms reduction. The advocates' ultimate goal is presumably disarmament. Clearly such a development is not for the

near term. There is little discussion in the current arms control literature concerning more distant prospects; the focus is on the immediate dangers of strategic weapons and arms technology. The common theme is that of identifying and magnifying the dangers of continued competition and the large expenditures (on both sides) that U.S. programs may induce through stimulation of Soviet responses. Action is said to be crucial to ward off the worst. Little effort is spent on examining the degree to which agreements could in fact ameliorate the situation. Any improvement is deemed valuable and important. Where things will be ten years from now is seldom described, even if their proposals for near-term agreements succeed.

(U) But even arms control advocates who believe in the inevitability of continued strategic arms competition tend to resist the argument that since the competition will continue, the United States must be an effective and efficient competitor. They concentrate so completely on the need to achieve stability that they will not draw the appropriate conclusion.¹ Publicly they may even contest the inevitability of the continued competition. Of course, the nature of the competition and the mix of U.S. objectives assumed in the strategic arms area are important. Some possible U.S. goals in the long-term competition are discussed in Section III. There it is assumed that stability of the competitive process is an important goal, but one that has to be traded off against other important goals. Admittedly the nature of the competition may be modified over time as the result of arms control agreements and other measures. Therefore, for at least

¹(U) The reluctance to accept the consequences of much less than perfect solutions to problems is widespread. If the probability of nuclear war cannot be made to be zero, or nearly zero, then some preparation for such a war is good policy. But some wish to put all resources on deterrence. No available policy can entirely remove competition in strategic arms; therefore, good policy involves competing while attempting to control the stability of the competition process. Yet arms control advocates are likely to be unwilling to recognize this, at least publicly. Perfect security against espionage and foreign intelligence activities is not possible. Intelligence operations accept this fact, countering with double agents and a variety of deception operations that make use of the foreign intelligence operations. This sort of balancing among objectives should be emulated in other areas.

some arms control advocates a satisfactory position can be found within a framework of strategic analysis that accepts continued strategic arms competition as a basic assumption, but which also incorporates arms race stability and other goals within that framework.

WHAT IS KNOWN ABOUT THE NATURE OF LONG-TERM STRATEGIC ARMS COMPETITION? (U)

(U) In recent years, implicit models of the arms race articulated by advocates of arms control, focusing on the growth of strategic weapons and arms technology, have gained prominence in the press and in congressional testimony. There are repeated claims that arms budgets are expanding, and attention is given to the action-reaction phenomenon that supposedly links decisions on both sides of the U.S.-Soviet strategic arms competition. It is alleged that the United States is racing with itself, that U.S. initiatives are the sole cause of the continuing and expanding strategic arms race. It is striking how few data are presented to support these assertions. Indeed, when Rand began its current work on modeling arms races (including empirical studies of U.S. and Soviet military budgets) an early finding was precisely how little empirical data have been presented. The current public discussion of the presumed strategic arms race is almost data- and fact-free.

(U) The views that dominate the public media are exaggerated and misleading. Figure 1 shows total defense and space expenditures in constant prices, the U.S. expenditures in constant 1958 dollars and the Soviet expenditures in constant 1968 rubles.¹ Statistical analysis of these data undertaken by John Despres using a variety of models of the interaction process shows: (1) models that assume immediate reaction of the Soviet military budget to the U.S. military budget do not fit the data; (2) more complex models that detect reactions extending over a period of time give surprisingly clear cut statistical results, including the finding that Soviet reactions in the 1950s differ from those in the 1960s. During the 1950s, the Soviet military budget reacted to changes in the U.S. budget, the effect extending over a period with a mean lag

¹(U) These data are preliminary. The Soviet data are derived from material from the intelligence community.

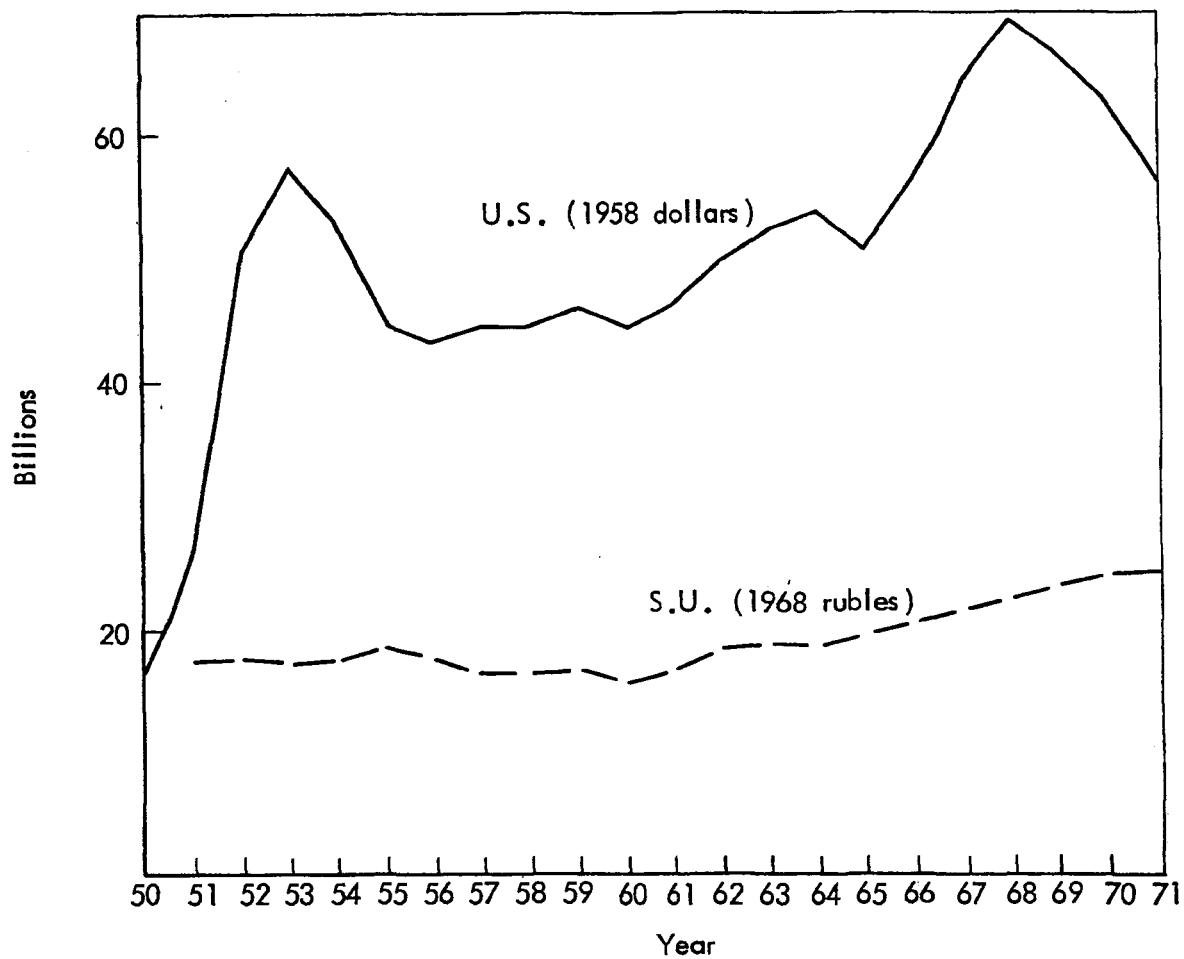


Fig. 1—Total defense and space expenditures (U)
(Constant prices)

of about 2.5 years. During the 1960s, growth in the Soviet military budget was linked more closely to the growth of Soviet gross national product than to changing U.S. military budgets.

(U) That there should be a complex and muted relationship between total military budgets in the two countries is not surprising. The best model of the process by which total defense budgets are set in the United States suggests that projections of total government income, existing and previously committed non-defense programs, defense expenditures, and budgetary deficits and surpluses are balanced in what President Eisenhower referred to as the "Great Equation":

$$[\text{Total government revenues}] + [(+) \text{ deficit or } (-) \text{ surplus}] = [\text{defense spending}] + [\text{non-defense spending}]$$

The four variables in the Great Equation represent four policy instruments. With policy objectives associated with all four variables, it becomes extremely difficult for any one instrument to vary so as to simultaneously meet the objectives of the other three. The Great Equation is a Great Identity....

Each of the four policy instruments has unique and important features that constrain its use....

At least for the present, any administration is fairly seriously constrained in its use of the left-hand side of the Identity to respond to desired changes on the right-hand side. 'Deficit' is a policy instrument responding to different sets of forces from those impinging on the right-hand side. 'Revenues,' aside from normal yield increases, is difficult to control as a policy instrument. This means that in normal times, whatever the total of revenues and deficit equals determines within fairly close tolerances what defense plus non-defense must add to. In a world where revenues and deficit have political and economic constraints attached to them, either defense or non-defense or both must also have fiscal constraints applied, because of the Identity.¹

In other words, the total U.S. defense budget is mainly determined, in peacetime at least, by factors that do not reflect Soviet military budget totals or specific military programs. Tax rates and hence total government revenues, or the political willingness to incur deficits,

¹(U) See J. P. Crecine, Defense Budgeting: Organizational Adaptation to External Constraints, RM-6121-PR, The Rand Corporation, March 1970.

may be determined by general swings in the U.S. public mood and in perceptions of the Soviet threat. But these perceptions do not quickly shift in response to changes in Soviet military expenditures.

(U) In the Soviet Union may not similar processes be at work? The military, industrial, and research establishments supported from the military budget have managed to secure an impressively steady share of GNP for their use -- perhaps a reflection of the five-year planning process. Total military expenditure including space, research, and unannounced military spending has fluctuated narrowly near 10 percent of GNP since 1958. The corresponding percentage for the United States has been similar but with much broader variations. The point is that in both countries the level of military expenditure is probably set not as a reaction to specific military moves of the other side, except in extreme crises, but as part of an independent budgetary process.

(U) Figure 2 shows strategic offense and defense expenditures on both sides. The data of the United States run only from 1956 through 1971. Expenditures for the years 1956 through 1960 are statistical estimates based on budgetary data not broken out in these specific categories. It is hard to see a spiraling arms race in this picture. Indeed, statistical analysis shows a negative correlation between the two expenditure patterns. On the other hand, data available on U.S. and Soviet spending on strategic offensive forces show a positive correlation with an average lag of about one year. This covers the first decade of ballistic missile deployment, from 1956 to 1965, and indicates that from the beginning Soviet force planners may have focused their attention upon competition in this area.

(U) What then is the character of the strategic arms competition? We do not have even a well-documented descriptive history of the strategic arms competition since the end of World War II, let alone first-rate models that would reveal the mechanisms that drive the competition. Again, it is worth noting how data-free most discussion of the supposed "arms race" is. Some aspects of the strategic arms competition, however, are relatively clear, although they would profit from more systematic study:

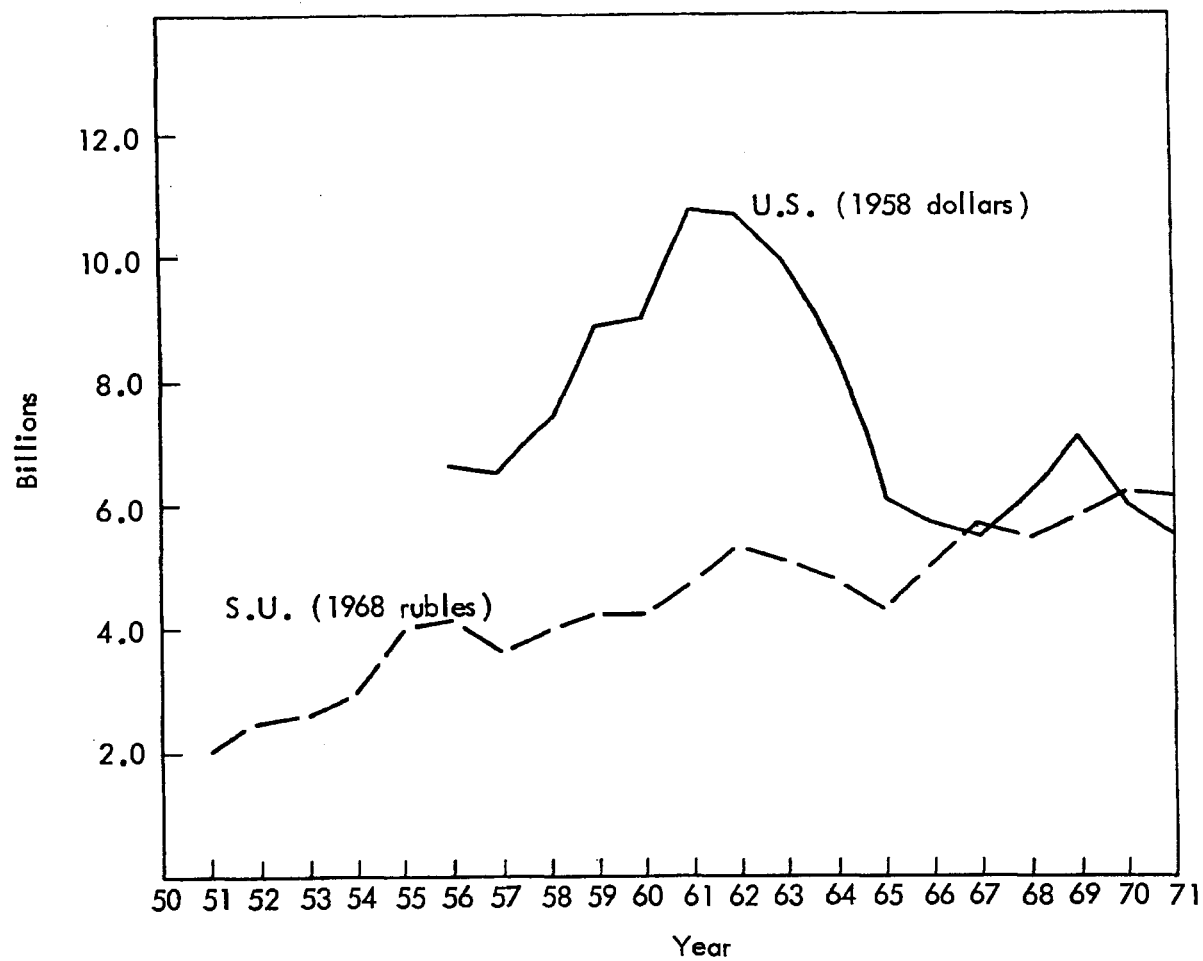


Fig. 2—Strategic offense and defense expenditures (U)
(Constant prices)

(U) 1. More detailed specification of areas of competition is needed. Many separate decision processes are at work, both in the United States and in the Soviet Union, that control the evolution of strategic force postures. Some relate to decisions regarding basic technology, others to later stages of military R&D, still others to force posture programs. Some of these decision processes may be more sensitive to opponent behavior than others. Some may have more policy and budgetary support because of the interest groups or organizations involved. An accurate characterization of the strategic arms competition would describe different areas of competition and the intensity specific to each area.

2. The strategic arms competition appears to be "more qualitative than quantitative." It is clear that the Soviets have been engaged in a well-financed, steadily growing, increasingly effective effort to catch up, across the board, in military technology. They came out of World War II considerably inferior to the West, and to the United States in particular, in key areas of military technology. Recognition of this led to the initiation, shortly after the end of World War II, of a long-term military R&D effort. Special organizational arrangements were made in the Soviet General Staff and the Ministry of Defense to push selected new weapon technologies. Systematic growth of the military R&D establishment began at the same time. The Soviet effort to catch up combined with an enhanced U.S. perception of the importance of technology in warfare, as a result of the World War II experience, led naturally to substantial competition in this area. This does not necessarily imply a close coupling of the two programs or decision processes. But both the United States and the Soviet Union have been systematically pushing military technology as a high priority area. To understand the character of the competition, we would have to know much more than we do about comparative U.S. and Soviet decision processes with regard to R&D programs. The things that are known about the nature of the Soviet military R&D decisionmaking process, and about how the Soviets are organized to do military R&D and basic research, suggest predictable patterns of behavior. But

there is no comprehensive, well-researched understanding of the U.S. process, let alone that of the Soviets.¹

3. What is clear from the evolution of military programs on both sides is that U.S. and Soviet styles of force posture programming differ greatly. Soviet programs are characterized by steady growth; they are slower-paced, more orderly. Eventually they produce larger force sizes. U.S. force posture programs show a tendency to occasional spurts, perhaps in response to shifts in perceptions of the threatening nature of the external world, which allows the allocation of increased resources to military uses. The United States appears the more clearly reactive power. Soviet design practices lead to simpler, less technologically adventurous, but cheaper weapons. This allows them to support larger force sizes than those of the United States in many areas. Although the buildup of their strategic offensive forces was slow in getting started (particularly as regards intercontinental offensive forces), it has shown a steady growth pattern. The two sides also differ in their patterns of phasing weapon systems in and out. The Soviets phase in new equipment much more gradually than does the United States; they tend to keep it longer and to phase it out more slowly. There are substantial operational differences, too, U.S. forces tending toward higher alert levels and more active training programs.

(U) These differences in the style of decisionmaking, in the comparative economics of the weapons acquisition process, and in operating practices led over time to substantially different forces on the two sides. Of course, as the Soviets have closed the gap with the United States in basic military technology, similarities between the forces have emerged. However, when viewed across the board and in detail, U.S. and Soviet forces in the strategic area, as elsewhere, are remarkably different: in the balance between various classes of weapons, in the

¹(U) See R. L. Perry, Comparative Soviet-U.S. Technology Trends (U), R-827-PR, The Rand Corporation, January 1972 (Secret). Also see A. J. Alexander, R&D in Soviet Aviation, R-589-PR, The Rand Corporation, November 1970. Our knowledge of the R&D process with regard to Soviet aviation is better than it is in other areas.

numbers of weapons, in the way in which the forces are organized, and in the way in which they operate.

WHAT IS KNOWN ABOUT THE INTERACTION PROCESS BETWEEN U.S. AND SOVIET STRATEGIC FORCES? (U)

(U) This question focuses attention upon the arms competition from a different perspective. It asks how decisions and actions on one side are influenced by decisions and actions on the other. The people who write on arms controls, who allude repeatedly to the action-reaction process relating U.S. and Soviet decisions regarding strategic forces, say little about this process or its mechanisms. The implicit model is that of two rational, perhaps somewhat paranoid, military planners who focus their attention closely on every move, every decision of the opponent and make appropriate adjustments in their own posture. It is alleged that what military planners consider "appropriate" will in fact be an overreaction. The criteria by which they operate tend to produce a spiralling process of interaction that accelerates the level of expenditures and the rate at which new technology is introduced.

(U) Occasionally, and increasingly, one sees in arms control discussions a more complicated model for the decisionmaking process. These variants are likely to involve the use of pseudo-actors, such as opposed groups of hawks and doves contending over policy -- for example, the Soviet military-industrial complex versus a group concerned for increased GNP growth. This complexity may be introduced to make the point that there are good guys as well as bad guys on the other side and that it would be appropriate to take (or withhold) some action, so that the good guys can more effectively sell their arms control proposals. This construction of pseudo-actors and pseudo-interest groups is likely to be misleading. A similar style of analysis of Soviet military decision-making, involving the so-called modernist versus traditionalist schools, has not been especially revealing or productive.¹ In any case the

¹(U) In this connection, see A. Trapans, The Role of Armor: Case Study of a Soviet Bureaucratic Decision Pattern (U), RM-5814-PR/ISA, The Rand Corporation, April 1969 (Secret-Privileged Information).

typical analysis assumes that if the Hawks or Doves win, the decision process reverts to the basic pattern -- the winning group implements its policy.

More serious classified studies uniformly conclude that the U.S.-Soviet strategic arms interaction process is a much more complex, slower moving process than is suggested by arms control advocates. An unpublished portion of a study by Loftus and Marshall, undertaken during 1959 to 1962, was devoted to the interaction process. The essential objective of their study was to find ways of improving U.S. intelligence estimates of Soviet strategic forces. Soviet reactions to U.S. force posture decisions, if predictable, could be used as a tool for that purpose. The evolution of Soviet strategic forces during the period 1945-1961 was reconstructed and set beside the development of U.S. forces, in particular that of the Strategic Air Command. Little clear-cut interaction could be detected at that time. The results of the interaction studies were not included in the study report.¹ If the interaction process were as clear-cut and immediate as the arms control advocates suggest, it would be an important aid in forecasting future Soviet strategic force postures. The fact that it has not thus far proved to be suggests that the interaction process is different from the alleged closely coupled action-reaction process.²

Two Stanford Research Institute studies, one published in 1967 and the other in 1970, conclude that the interaction process is very complex.³ In 1968, a special panel of consultants conducted a study for Ivan Selin in OASD/Systems Analysis, focusing on decisionmaking

¹(U) J. E. Loftus and A. W. Marshall, Forecasting Soviet Force Structure: The Importance of Bureaucratic and Budgetary Constraints (U), RM-3612-PR, The Rand Corporation, June 1963 (Secret).

²(U) It is only fair to note that if the Soviet reaction pattern were slow and protracted, the Loftus-Marshall study would not have detected it. Also such a reaction pattern probably would not be of much use. The most likely area of interaction was neglected: that is, that of Soviet reactions to U.S. European-based forces during the 1950s.

³(U) F. P. Hoerber, "An Analysis of U.S.-Soviet Strategic Interaction Process (U)," 1967, and William T. Lee, "Consistency of USSR Doctrine and Force Development 1955-70 (U)," 1970, Stanford Research Institute, both classified Secret.

processes in the Soviet political military establishment with respect to the development and procurement of strategic weapons. Its objectives were: (1) to suggest explanations for a number of puzzling features of Soviet strategic weapons programs of that period; (2) to help the Systems Analysis staff respond to Secretary McNamara's increasing desire to use U.S. force posture decisions to control and direct the joint evolution of U.S. and Soviet strategic force postures. Any insights into Soviet decisionmaking and the interaction process developed by the study were also to be used in preparing for the then expected arms control discussions (SALT) with the Soviets. Major findings of the study were (1) that the U.S. intelligence community had not developed an adequate understanding of relevant Soviet decisionmaking processes (indeed, it was not then systematically attempting to collect appropriate information, or to develop methods of analysis likely to produce useful insights), and (2) that the most appropriate assumption to make about relevant Soviet decisionmaking processes is that they occur within a complex set of organizations and bureaucracies. The Soviet decision-making process should therefore be assumed to exhibit the limited rationality and have the coordination problems typical of all large organizations and governments. In particular, the decision processes must not be assumed to be effectively controlled by one central decision-making unit that makes all decisions in accord with a simply stated set of goals, or a simply described military strategy.

(U) In particular, the consultants' report stated:

(U) In order to understand or predict the interaction of Soviet and U.S. postures, we require an improved understanding of the decisionmaking process within the relevant parts of Soviet political-military organizations. In particular, we require such an understanding for useful forecasts of the future evolution of Soviet strategic offensive and defensive forces, and of Soviet responses to specific possible changes in U.S. programs. Much effort has been devoted to finding ways of answering the question, "what would the rational Soviet planners do?" But very little systematic effort has been applied to answering the possibly even more relevant questions:

1. "What are the Soviet decision processes really like?"
2. "How might a complex Soviet bureaucracy respond to particular U.S. program choices?"

(U) In our judgment, decisions made by complex bureaucratic organizations can be neither understood nor predicted without a careful specification of the processes that produce those decisions. In particular, simple models that presume effective central direction, complete information, and consistent goals persistently ignore the realities of the decisionmaking process in large organizations. For example, decisions are made within the context of standard operating procedures, pervasive sub-unit independence from top level control, and general bias and confusion in the information flows within the organization. Such realities, in fact, dominate a large proportion of the decisions made within any large organization.

(U) It is impossible under most circumstances to interact effectively with an organization as complex as the Soviet military establishment without an understanding of these apparently mundane aspects of the process. This simple, almost self-evident, proposition is clear both from our discussion with observers of the Soviet scene and from our understanding of how large scale organizations operate in general. It is, however, persistently violated in most efforts to interpret or describe Soviet military and governmental behavior.

(U) Can we in fact come to know, or to infer, what the Soviet decision processes are really like? Can we substantially improve our ability to forecast how the complex Soviet political-military bureaucracy is likely to respond to particular U.S. program choices? The answer to these questions is a qualified "yes."¹ We cannot now do these things. We know enough, as is suggested above, to realize that the simple models are not only wrong, but make inaccurate forecasts. Moreover, some progress has been made in understanding Soviet decision-making processes and patterns of behavior.²

¹(U) See G. T. Allison, Jr., and A. W. Marshall, Explanation and Prediction of Governmental Action: An Organizational Process Model (U), RM-5897-PR, The Rand Corporation, May 1969 (Secret).

² The panel report to Selin included a summary of what could be said about Soviet decision processes. Also see Alexander, R&D in Soviet Aviation, and Trapana, The Role of Armor. A good deal of work on Soviet R&D decisionmaking has been produced at the Air Force System Command's Foreign Technology Division. Some promising efforts are now started elsewhere within the intelligence community.

(U) A promising way of improving our knowledge of the interaction process would be to develop models of relevant Soviet decisionmaking processes, using what is known of various features of the Soviet military organization and related bureaucracies. This includes material on formal organization, career systems, budgeting and accounting systems, measurement systems, reward and punishment systems, and other factors likely to influence decisionmaking processes. This information, together with current understanding of typical organizational behavior and how it is related to various features of organizations and organizational life, would make it possible to improve upon current highly simplified models. In the longer run, more suitable materials could be collected and incorporated. Within five years our understanding of Soviet behavior in selected areas can probably be substantially improved, compared with its present state. But this will not happen automatically; a major effort is required. The success of such an effort would allow us to make better guesses about Soviet reactions to U.S. decisions and actions.

But what can be said now about the general nature of the interaction process? The following appears to be the best general view.¹ Each military establishment is involved in a continuous process of adapting to its changing environment, part of the environment being the changing military posture of its chief opponent (or opponents). (The developing power of China will need to be considered now in studies of Soviet decision processes.) The adaptive process also involves responses to technological change and changes in the worldwide political environment. The latter, in particular, tends to influence (exogenously) the budget levels available to the military establishments, producing from time to time periods of budgetary expansion or contraction.

The process of adaptation involves periodic major adjustments in objectives, strategy, and major programs — perhaps even (though more rarely) major reorganization of the military establishment itself.

¹(U) This treatment parallels that in Allison and Marshall, Explanation and Prediction of Governmental Action.

These periods of major adjustment arise irregularly, and decisions regarding the adjustments are made mainly by the upper-level decision-making strata within the organization. A major adjustment may be triggered by changes in budgets or by a critical event, such as the Cuban missile crisis. Between periods of major adjustment there is a steady process of change and adaptation accomplished by the routine functioning of the decision processes within the relevant organizations.¹

Both the Soviet and the U.S. military establishments are clusters of organizations, interconnected as regards perception and stimulation to adaptive change. The picture of the adaptation process as operating by means of rational centralized planning on either side must be rejected, except perhaps during a period of major adjustment. That is, the interaction process cannot be pictured as one in which changes in the other nation's forces are perceived centrally at a high level, appropriate countering force posture or program changes are decided upon, and orders are transmitted to lower levels for implementation. Rather, the perception of force posture changes in specific parts of one nation's military establishment is likely to be centered in a specific set of suborganizations in the other nation's military establishment. Each of these suborganizations, such as the five Soviet military services and their component branches, will have its own perceptions of important changes in U.S. force posture. Each will have its own goals and aspirations, especially with regard to increased budget and new programs to meet changes in those parts of the U.S. military establishment where it focuses its attention.

The nature of the budgeting and programming process within the Soviet military establishment will greatly affect the degree to which a specific change in U.S. force posture, perceived by a subpart of the Soviet military establishment, will lead to a change in Soviet programs. Some changes in U.S. posture are likely to go unnoticed, or

¹(U) See Robert N. Anthony, Planning and Control Systems, Graduate School of Business Administration, Harvard University, Boston, 1965, for a description and categorization of the decisionmaking process in large business organizations. He separates the total process into strategic planning, management control, and operational control processes.

if noticed, to be reacted to weakly. No Soviet organization may be interested in the problem raised by changes in that part of the U.S. establishment. Or it may not be in a good position to push for additional budget and new programs. Or other problems may dominate the internal decisionmaking process of the military establishment at that particular moment. For example, it may be a time of budgetary retrenchment, or a new budgetary ceiling may have been set after a period of rapid budgetary increase. In that case, on-going and partly completed programs will have priority over new ones and will probably exhaust the resources available.

Changes in U.S. posture can more easily increase resources going into a particular Soviet program than reduce them; there is a kind of ratchet effect at work. When a change takes place in U.S. posture, or is proposed, an interested subpart of the Soviet military establishment can use this to make a case for what it will depict as appropriate change in Soviet military programs. It will undoubtedly suggest increases in its own programs. It is not likely to suggest that its funds be reduced.

Thus, thinking about the possible effect on Soviet military posture of specific changes in U.S. posture, in an organizational-process-model analysis, one would ask:

1. What organizational subparts of the Soviet military establishment are most likely to perceive this change?
2. What are their current organizational goals?
3. What opportunities have they to react to the U.S. change?
(Is the Soviet military budget going up, staying stable, or going down?)

These are appropriate questions if the change in U.S. posture envisions a new program, a modernizing of some part of the U.S. forces. What of U.S. restraint or reduction in forces or military expenditures? There is a real question as to the impact on Soviet military programs. By holding U.S. military budgets down, there may be some reason to believe that the total Soviet military budget will

ultimately either stabilize or be reduced. The Soviet Union has other uses for these resources, and U.S. restraint can add to the effectiveness of those who argue for the diversion of such resources to non-military uses. On the other hand U.S. restraint in some areas may stimulate increased Soviet efforts. A Soviet military man could argue that a Soviet increase (at least one round) now has a chance of buying a real advantage over the United States; whereas if the United States were continually increasing its expenditure it might be argued that the possibility of achieving a big advantage is quite limited.

There is the possibility of maintaining Soviet expenditures in areas that are least threatening to the United States. For example, it would seem possible to keep the Soviets spending relatively large amounts on bomber defense by maintaining even a small U.S. bomber force. The United States could take advantage of the presence of strongly entrenched subparts of the Soviet military establishment, once identified. Resources could be drained away from other, more threatening programs.

The above discussion shows how different the questions addressed and the mode of analysis used under this heading differ from those in the standard arms control literature. More attention is paid to selective perception within complex military establishments. The tactic of signaling -- especially attempts at tacit influence by means of subtle signals -- seems less promising than the standard analysis suggests. If it is to succeed, signaling will have to be better directed to relevant targets, not to a black box labeled the Soviets, or the Soviet government. In some cases influencing Soviet programs may be next to impossible. The United States may be unaware that the Soviets are going to acquire a particular system until it is well along in the R&D process. Influencing the Soviets at that point will be extremely difficult, since the program by then will have strong bureaucratic support, individuals' careers will be bound up in the success of the program, the organizations involved will have a strong stake in the continuation of the program, and so on.

(U) To summarize, there is no spiraling arms race, either in total military budgets and force sizes or in strategic-area budgets and force sizes. There is no clear-cut, well-documented rapid action-reaction cycle. If there were, much could be made of it in making intelligence estimates. The current conventional wisdom about the arms race assumes a kind of decisionmaking behavior on both sides that is in itself suspect. Real-life decisionmaking on both sides takes place within large, complicated bureaucracies. What we know about the characteristics of decisionmaking within such organizations, or clusters of organizations, makes it improbable that many of the simplifications involved in typical arms race models are correct. In particular, it is doubtful that the forces on either side develop in conformity to any simply stated set of national goals. They are more likely to evolve from year to year as a result of piecemeal budgetary and program decisions and, in any case, to be influenced by the interest of subgroups within the relevant military and industrial organizations. Overall consistency in the program is thus unlikely. Perceptions of the activities of an opponent are not highly centralized but developed at many places within each of the bureaucracies.

(U) This does not mean that there is no interaction, only that it is complex, and the interaction process is not now well understood. There is a need to differentiate the many sorts of interaction. For example, at the tactical level the interaction process may be relatively clear; if the Soviet Union alters its radar frequencies, the United States will alternate jamming and chaff specifications. We must separate the various sorts of actions: fixes to current equipment from procurement decisions on new systems from major policy changes involving follow-on programs or total budgets. Each is decided in different ways by different decision processes.

HOW IS THE UNITED STATES DOING IN THE LONG-TERM STRATEGIC ARMS COMPETITION? (U)

(U) The answer is that we do not know exactly. Some trends seem clear: the Soviet Union has been overtaking the United States, overcoming its lead in such key areas as military technology and strategic

offensive forces. Enough is known about the comparative economics, in the United States and Soviet Union, of developing, procuring, and operating strategic forces to raise troubling questions about possible further degrading of the U.S. position relative to that of the Soviet Union. But there are no first-rate studies of the problem. The sort of net assessment needed has not been undertaken within the U.S. government. Earlier efforts at net assessment of the strategic balance are limited in scope and method.

(U) Many problems are encountered in assessing the past and current military balance and identifying future trends. Among them are the following:

(U) 1. The military effectiveness of strategic forces is difficult to assess. Soviet and U.S. force postures are substantially different, complicating the already difficult job of comparing strategic forces and programs composed of so many varying elements. Whatever the limits of assured destruction as a force design or force-sizing criterion, it is clearly inadequate as a criterion for assessing force effectiveness. Performance studies of U.S. and Soviet forces in a wide range of contingencies and employing a wider set of criteria are obviously required. The peacetime political value of the forces and their use in political-military crises, for example, is clearly relevant.

(U) 2. Determining the relative efficiency with which the United States and Soviet Union acquire and operate strategic forces, so important in judging future trends, is very difficult. It is desirable to develop a single measure of value, which implies exploring appropriate exchange rates between dollars and rubles. But there are conceptual and data problems in doing so.¹ One is attempting to establish a common measure for a mix of goods and services produced by two economic systems widely disparate in structure and price relationships. The greater the disparity in economic structure, the greater the difficulty in drawing meaningful comparisons.

¹(U) See Perry, Comparative Soviet-U.S. Technology Trends, pp. 19-24, for additional discussion of this problem as it applies to Soviet-U.S. military R&D programs.

The Central Intelligence Agency has devoted a substantial effort to costing Soviet military programs. It has succeeded in shedding considerable light on comparative force structure issues, the probable allocation of resources to missions, and trends in these allocations. The comparative efficiencies of U.S. and Soviet efforts have been less well illuminated. Moreover, misuse of the results has produced confusion as to comparative efforts -- U.S. and Soviet -- when Soviet programs are costed in dollars. Some examples of this confusion deserve mention.

Concern is expressed regarding relative U.S. and Soviet defense postures and budgets in 1970, when U.S. defense and space expenditures exceeded Soviet expenditures by approximately 40 percent, using U.S. prices in accordance with the CIA methodology. The U.S. military position, however, appears to be deteriorating as Soviet forces grow, in comparison with U.S. forces, in size and in some cases in effectiveness. But using the same techniques, the United States was outspending the Soviets by only about 20 percent during the period 1960-1962, a period when the U.S. posture relative to the Soviets was improving rapidly. One inference that cannot be drawn for those who accept the methodology is that our problems, if they exist, reflect deficiencies in the application of gross resources. The comparison in both periods does suggest, however, the resource overstatement inherent in estimating foreign-nation expenditures by this method.

The CIA methodology automatically also provides a substantial premium for the Soviets in the form of increased estimate of outlays -- reflecting serious inefficiencies in some American production processes -- while obscuring the inefficiencies that are the root cause of the problem. Eliminating U.S. inefficiencies would provide a double benefit -- increasing U.S. output for given dollars while reducing nominal Soviet outlays as measured by the standard of excessive American costs.

(U) Ship construction is, perhaps, the most dramatic example of this sort. U.S. shipyards are inefficient -- almost twice as costly as the better European yards, and more costly still in comparison with Japanese yards. If the United States could achieve comparable efficiency

in its yards (or if it purchased naval vessels from Japanese yards), it could, of course, construct more ships at lower costs. Particularly interesting, however, is that the dollar estimates for Soviet ship construction outlays would halve as a result of the improvement in U.S. efficiency -- a rather anomalous result. The better course for the United States would seem to be to get on with the problem of solving its own inefficiencies, rather than taking the inflated Soviet dollar equivalent at face value.

Even worse, these cost estimates acquire a life of their own -- producing what Whitehead called the fallacy of misplaced concreteness. The effect of employing the CIA methodology is to eliminate price differences resulting from differences in cost. But this is forgotten in the process of using the data, despite CIA efforts to prevent misinterpretation of their work, so that differences in weapon design are hidden. To give another naval example, it may be suggested that a problem arises for the United States because Soviet destroyers "cost" only \$40 million in comparison with \$80 or \$85 million for the "equivalent" U.S. destroyer. This suggestion is totally invalid, since in the CIA methodology, all differences in real cost have presumably been eliminated. The difference in price would therefore have to reflect the fact that the Soviet destroyer was more simply designed. If it turned out to be the equivalent of U.S. destroyers, we would have something to learn. But whatever we learned would have to do not with cost differences but with design differences. To infer a cost difference is to impose a fallacy on top of a methodology that is acceptable only so long as it is understood.

(U) Despite these problems in comparing U.S. and Soviet programs, some troubling contrasts and trends appear as the result of first attempts at relevant comparisons. For example:

(U) 1. The Soviets may be more efficient than the United States in developing, procuring, and operating military forces. The way in which Soviet R&D is organized and conducted may give them a comparative advantage in this area. Their design philosophy appears to lead to low-cost, rugged weapons. By contrast, U.S. weapon design practices

lead to some gold-plating and advanced, but difficult to maintain and operate, weapon systems. Procurement and phase-in/phase-out policies differ. For example, the Soviets keep older items of equipment around a good deal longer. The Soviets now have approximately 1,500 deployed ICBMs. To get that total they will have deployed altogether about 1,504 missiles. In contrast, after the United States has completed the phase-out of the Minuteman 1-Bs, its 1,054 missiles will be what remains of approximately 2,500 missiles deployed during the period from 1959 to the present. All of the Atlas missiles, the Titan Is, and the Minuteman I-As have already been removed. The Soviets have phased out only a handful of SS-6s. But this means that the Soviets still have a large number of soft SS-7s and SS-8s, as well as some hardened SS-7s and SS-8s. To the extent that these older weapons are not as reliable or capable as newer systems, measures based on total numbers do not truly reflect the comparative capabilities of the two forces. On the other hand, the rapid turnover of weaponry in U.S. forces raises questions as to the efficiency of these practices. This general difference in the pattern of phase-in/phase-out of weapon systems runs throughout the U.S. and Soviet forces. It is substantially more expensive to phase in and phase out forces; this also may be an area where the United States may be handicapping itself in the long-term competition with the Soviets.

U.S. and Soviet operational practices differ. U.S. forces use more expensive training methods -- for example, U.S. pilots fly more than their Soviet counterparts. U.S. forces tend to keep higher levels of alert and probably generate higher maintenance costs. Some reduction of Soviet maintenance costs flows from design practices that, among other things, lead to common use of identical components -- for example, avionics packages and even some airframe components are shared by several aircraft.

(U) In any case, the Soviets succeed in acquiring and operating large forces for surprising low levels of resource input. Consider their massive air defense system. How do they maintain and operate all those radars, SAMs, and aircraft?

(U) 2. The Soviets are catching up in key areas, areas where the United States has traditionally led, such as military technology, naval forces, and strategic offensive forces. These areas are not coextensive with the strategic forces area, but attention to what has happened in all these areas is of interest. The steadily increasing Soviet military R&D effort now appears to involve about the same level of resource input as that of the United States. It has grown relative to that of the United States, and projections of current trends show it likely to be larger than the U.S. program in the mid or late 1970s. Moreover, as indicated above, the Soviets may use their resources more efficiently in their R&D process.

(U) In the strategic offensive forces area the Soviet buildup has given them a force posture comparable to that of the United States. As late as the mid 1960s the United States clearly had the superior posture. The U.S. response is now focused on SALT, holding in readiness a variety of programs to implement should SALT fail or produce only limited agreements. As argued earlier, even if SALT is successful, it is likely to produce only partial control over the competition. In the naval area, the Soviets are building up their forces, especially submarines. They are ahead in a number of key technologies, especially those connected with missiles launched from aircraft or ships to attack surface vessels. The main difference from the past, however, is that they are out in the world more and operating in a different mode. They are more visible. It may be that the Soviets are building the right kind of navy and that we have been building the wrong kind.¹

(U) Thus, the Soviets now have to be accepted as serious competitors all across the military spectrum. Of course, superiority of one sort or another has always been conceded to them in some areas. But

¹(U) The 1971 prize essay by Captain Robert H. Smith, "A United States Navy for the Future," U.S. Naval Institute Proceedings, Vol. 97, No. 3, March 1971, contains a diagnosis that the United States is building the wrong kind of navy and doing so very expensively. Also expressed is concern for the consequences in the long term of continuing the current U.S. Navy and Department of Defense practices that led to these problems.

the possibility of their leadership in key areas where the United States has relied on being ahead is disturbing. They have either erased the U.S. lead or are testing the U.S. position in important ways.

(U) These developments raise questions as to how the Soviets get so much for their resources. Indeed, there is some question, to put it in an extreme form, whether the United States is not pricing itself out of the arms competition with the Soviets. To put it less extremely, the United States may be severely handicapping itself in the long-term competition with the Soviets by not being efficient enough in its weapons acquisition process, its procurement and phase-in/phase-out policies, and its operating practices. As long as the United States was comfortably ahead in the strategic forces area, particularly the strategic offensive forces area, perhaps the cost differences between U.S. and Soviet practices did not matter. Now this is no longer the case; U.S. weapon design, procurement, and operational practices now may have to be reconsidered. If not, prospects in the longer term may not be good. The United States may have to learn from the Soviets in those cases where they have found a genuinely better way. In other cases the Soviets may have significantly reduced military effectiveness by choosing a cheaper weapon or operating practice. If so the United States should credit itself with superior performance bought at some added cost. All too often our comparisons of U.S. and Soviet forces fail to make appropriate and insightful comparisons of input cost and military performance output. Making such comparisons is not easy, but we have to do a better job than has been done in the past.

(U) Worry over these developments is reflected in the increased interest at top levels of the U.S. government in undertaking net assessment. At these levels it is inevitable that a good deal of interest will center on the relative efficiency with which the United States and the Soviet Union produce military forces. How can the United States continue to maintain a force posture adequate to counter the Soviet military buildup? In view of the enormous expansion of the Soviet economy since the time when Acheson and Truman set basic U.S. policy for the long-term competition with the Soviets, as well as the changed attitude of the American public, it will no longer be possible to prevail

simply by compensating for deficiencies in output, processes, or organization through financial force majeure. Nor is it appropriate to do so; the American citizen may be asked to underwrite expanded military capabilities, but not to underwrite, over the long haul, continued sources of inefficiency.

(U) Moreover, the application of excess resources does not solve the problems. It merely obscures the continued presence (where they exist) of inefficiencies, poorly designed force structures, and faulty doctrines. Alleviation of fiscal pressure may prevent the elimination of practices or force components that should be purged. Some of our problems may be solvable (at least temporarily) by the superaddition of resources, but not all of them. Indeed none of them can be solved in this way in the longer run. The U.S. goal has to be greater efficiency than the Soviets.

III. DEVELOPING A STRATEGY FOR THE LONG-TERM STRATEGIC
ARMS COMPETITION (U)

(U) This section discusses U.S. goals in the long-term strategic arms competition and the development of a strategy to achieve them. The discussion is necessarily preliminary and incomplete; appropriate U.S. goals for the long-term competition could emerge only from an energetic process of debate among a wide range of people and organizations within the U.S. government. But what follows may be useful as a starting point for discussion.¹ This discussion of the elements of a strategy for the long-term strategic arms competition tries to highlight the difference it might make to view problems related to strategic force posture within the framework of the long-term competition. What decisions might be made differently? What new considerations might be brought to bear upon decisions related to U.S. strategic programs? What new lines of argument might open up, or achieve special prominence? What changes in decision inputs and methods of analysis are likely to be needed?

U.S. GOALS IN THE LONG-TERM STRATEGIC ARMS COMPETITION (U)

(U) U.S. goals in the strategic arms competition can be organized in several ways. For example, one might group goals into shorter-term and longer-term goals. Or, one might group them (as is done below) according to whether they relate to the strategic force or to the strategic arms competition.

(U) In any case, an early comment about U.S. goals is that they are multiple. This in itself is important, since it provides an immediate basis for argument against those who focus upon one goal, or a very

¹(U) Another starting point is a review of past U.S. policy; much of it is relevant to U.S. goals in the strategic arms competition. During both the Truman and Eisenhower administrations attention was devoted to policy for a long-term competition with the Soviets. During the 1960s McNamara became increasingly interested in the strategic interaction process and the possibility of controlling the joint evolution of U.S. and Soviet strategic forces. Future strategy for the long-term strategic arms competition should be tied, if possible, to already established policy roots derived from the past.

small number of goals to the exclusion of all others. A convincing case can be made that there are many goals that should guide the evolution of U.S. strategic force posture. Tradeoffs are necessary among them and are a key problem for analysis. Arms race stability is an important U.S. goal, but only one among many.

(U) The following is an illustrative set of possible U.S. goals that reflect the range of goals that ought to be considered in the design of U.S. force postures and other policies and programs related to strategic forces:

(U) 1. Strategic Force Posture Objectives

- a. Deter nuclear attack upon the United States.
- b. Deter nuclear (or in specific cases conventional) attack on allies.
- c. Contribute to favorable outcomes of political-military crises.
 - o Maintain deterrence of attack on the United States.
 - o Limit escalation and assist in keeping hostilities to a minimum.
 - o Contribute to U.S. negotiating and bargaining power.
- d. Minimize damage to the United States in case of limited attack by a smaller nuclear power, or in case of accidental launch of a limited number of weapons against U.S. targets.
- e. Maximize peacetime political impact.
 - o Maintain U.S. superpower status in the eyes of Third Area elite and third party countries generally.

2. Control and Guidance of the Strategic Arms Competition

- a. Control the character of the competition.
 - o Maintain stability.
 - o Make force posture programs consistent with long-term goals of achieving arms control agreements.
- b. Attain long-term goals in strategic arms area.

- o Steer toward and attain minimally dangerous postures (for example, less accident-prone or destructive, in case deterrence fails).
 - o Limit proliferation of additional nations with strategic nuclear forces.
 - o Improve the possibilities for coping with complexities introduced by emerging Chinese strategic nuclear forces, and those of any other major power center (for example, Western Europe).
- c. Maintain an effective, efficient U.S. role in the continuing strategic arms competition.
 - o Improve U.S. comparative advantage over other competitors -- particularly the Soviet Union -- in acquiring and operating strategic forces.

(U) This is, of course, only an outline. Each of the stated goals could, and should, be explicated in a more detailed and specific fashion. The author has little to add, here, to the discussion of the first category of goals. Most attention has been devoted to them, although major improvements can be made in current formulations. Most such listings tend to neglect important political and crisis uses of strategic forces. U.S. strategic forces are a symbol of U.S. superpower status. The strategic balance with the Soviet Union, as perceived by third parties, may have important day-to-day political impact upon the behavior of other nations. The stance taken by U.S. leaders in future political-military crises will be conditioned by the size and nature of U.S. strategic forces. Indeed, one of the most telling arguments against extreme finite deterrence views, which suggest that an assured capability to destroy a handful of Soviet cities will effectively deter Soviet attack, is the psychological impact that a large imbalance in the size of U.S. and Soviet strategic forces might have upon the behavior of U.S. leaders in a political-military crisis. Not only are important goals and roles of strategic forces missing from most formulations, but the goals that are included are stated entirely in negative and defensive ways. Forces tend to be designed to ward off the worst. Enhancement of the chances of good outcomes of political-military crisis, for example, is almost

never considered as an objective. Have strategic forces no role other than preventing the disaster of rapid escalation, or of deterring an all-out attack upon the United States? Clearly they can play other roles and have more positive effects, especially if some attention is paid to giving them capabilities of doing so.¹

(U) With regard to the goal of maintaining the stability of the strategic arms competition, it is reasonably clear that the United States wants the competitive process to evolve within some set of bounds. Limits might be sought upon rates of expenditure, especially upon changes in rates of expenditure. Rapidly changing expenditure levels cause budgeting and programming problems. There is a value to keeping the pace of the decisionmaking process required by the competitive process in line with normal budgeting and other decisionmaking schedules. Also, alteration of the pace of the competition may reflect swings in the character of broader political relationships with the Soviet Union and other countries. In any case, thought should be given to U.S. preferences for stability in the competition, and appropriate measurements of stability need to be devised.

(U) To take another example, maintaining an effective, efficient U.S. role as competitor has many aspects. The goal itself has two sides: one, to make the United States a low-cost producer of effective forces; the other, to induce Soviet costs to rise, to complicate Soviet problems in maintaining its competitive position. Subgoals include maintaining the health and vitality of the U.S. aerospace industry and steering the competition into areas where the United States has a substantial and enduring technological lead.

(U) Finally, in the joint evolution of the U.S. and Soviet strategic force postures some directions are to be preferred to others. Some U.S. preferences will be shared by the Soviets. Neither wants accident-prone forces in existence. Some areas of potential competition

¹(U) It may be that the tendency to focus upon a limited set of goals, stated in a negative and defensive fashion, stems from the multi-person nature of the relevant U.S. decision processes. They may represent lowest common denominator formulations; all that can be agreed upon within the group is that the worst be warded off. Positive goals evoke more disagreement.

may be mutually agreed to be best left alone, or put aside. Since the probability of nuclear war cannot be brought to zero, there should be a preference for postures that are less destructive and more subject to control should nuclear war occur. Some preferences, on the other hand, may be peculiar to the United States. It may be possible through U.S. moves, based upon a superior understanding of the interaction process or other aspects of the competition, to steer Soviet posture choices to some extent. In that case, U.S. preferences would be operative. U.S. preferences, all things considered, probably are that the Soviets expend resources on defensive rather than offensive systems. This is stated here despite current argument as to the destabilizing role of ABM deployments. The United States also prefers that the Soviets expend resources on short-range offensive systems rather than on intercontinental ones.

U.S. STRATEGIES FOR THE LONG-TERM COMPETITION (U)

(U) Until goals are agreed upon, it is difficult to say what the strategy should be. However, it is important that account be taken of the following:

- o Both sides compete within a number of constraints, especially as regards budgets and imperfections in their decisionmaking processes, which slow and diffuse reactions to opponent moves or to new technological opportunities, and generally limit the efficient use of resources.
- o The competition will be prolonged -- indeed, for planning purposes, endless. Hence, considerations with mainly long-term payoffs must enter into the formulation of the strategy.
- o When fully articulated U.S. strategy should be embodied in broad policy guidance as well as in specific operational guidance to particular decision areas (basic technology programs, weapons R&D, force posture programming, updating of systems in response to Soviet developments, and so on).
- o Strategies will employ such means as arms control agreements, tacit understanding, and unilateral decisions and acts to implement policy.

(U) Some examples of possible strategies for the long-term strategic arms competition may be useful.

R&D Strategy (U)

(U) The Soviets have largely erased the U.S. lead in military technology, which has probably been one of their top goals since World War II. Previously, the United States could stay ahead in all of the areas of technology that it cared most about because it had a lead and because the total resources the United States was devoting to military R&D were significantly larger than comparable Soviet expenditures. But now, in view of U.S. resource constraints and the growing Soviet military R&D programs, the list of areas in which the United States tries to lead will have to be reduced. To develop a new R&D strategy, the comparative costs of being a leader or a follower in specific technology areas need to be assessed. Where can the United States best afford to trail Soviet programs? How can it make use of Soviet developments? Can it save money by doing so? Where should it try to stay ahead? Where should it invest in building new areas of comparative advantage through new or larger R&D programs?

(U) A general theme of strategy development should be the seeking of areas of U.S. comparative advantage, and the steering of the strategic arms competition into these areas, where possible. Where are these areas in U.S. military R&D?

One such area is computer technology, where the United States has a substantial and durable lead. A good strategy would be to develop that lead and to shift concepts of warfare in ways that capitalize on it. War-fighting strategies suggest themselves, for they require sophisticated command and control, rapid information gathering and processing, and adaptive planning during the war. Superior war-fighting strategies are likely to favor complex adaptive command and control processes, which might aim at learning early in the war how best to conduct warfare in the particular situation. Another possible payoff in the computer field lies in terminal guidance. The Soviet guidance philosophy has not required them to use on-board computers

in their missiles. The United States has done so and has developed the required miniaturized components. To some extent, it has been a disadvantage, in that it has added some special vulnerabilities to U.S. systems. However, in the longer run -- if pushed farther -- it might be a significant advantage, especially if terminal guidance is required to reduce CEPs close to zero.

U.S. advantages may lie also in the flexibility with which the United States deploys and re-deploys resources. A striking difference between the U.S. and Soviet R&D programs is the greater steadiness of the Soviet effort, measured both in total resources and in the stability of funding and personnel of design bureaus and research facilities. This has been a strength of the Soviet system, particularly in its long effort to catch up with the United States. However, Soviet military R&D expenditures cannot continue to grow much longer at 10 percent per year when the total military budget is unlikely to increase at more than 4 to 5 percent per year. Soviet R&D expansion will have to top out sometime soon. When it does, current institutional forms and other practices may produce a number of problems. The Soviets may find it more difficult to maintain the productivity of their research establishments. They will probably top off the growth by reducing the flow of younger and more energetic people into the organizations. Over time, this will mean a significant aging of the staff, and perhaps a reduction in creativity and productivity. Thus, it may be that the United States has an advantage, if a new area of technology emerges as important, in being able to shift resources to it rapidly. The United States may also have an advantage in being better able to reduce expenditures judiciously in less productive areas of technology. Thus, overall, the efficiency with which R&D resources are spent, perhaps, can be made higher than that of the Soviets.

(U) Another element of a strategy for the long-term competition involves opening up new areas of technology. Past evidence on Soviet behavior suggests that they will enter the area also, but since they may have more trouble bringing new resources to bear, the United States should obtain a lead. Thus, a fundamental part of the U.S. strategy may be to push innovation in technology vigorously. The problem will

be to keep innovation under better cost control. There is a tendency to push too hard, too fast, and too far in new areas. Pushing beyond research to development, and on to procurement, too rapidly tends to create future operating and maintenance problems. But when opening a new area of technology is viewed as part of a conscious strategy for the long-term competition, it is imperative that the U.S. weapons acquisition process be improved. It will not be easy. There are fundamental problems in the current weapons acquisition process. Gold plating and other practices that make weapons cost so much must be controlled. Also, intense spurts, as in the responses to the "missile gap," should be avoided, unless, of course, they are a calculated part of strategy (for example, an effort to put pressure on the Soviets). The United States might engage in occasional spurts to attract attention to a particular area where it wants to compete, because it believes it has a technological advantage or that it is more efficient in relevant areas of manufacturing, and so on. But can strategies of this sort be carried out? Can U.S. national decisionmaking processes and military organizations be remolded to implement them? One cannot be optimistic.

Parenthetically, there is another possible U.S. military R&D advantage. U.S. non-defense technological R&D has more likelihood of producing payoffs in the military area than does that of the Soviets for two reasons. First, the levels of technological sophistication in the military and non-military areas in the western world are much closer together than they are in the Soviet Union. In the Soviet case, the level of R&D in the non-defense area and the level of technology embodied in consumer products are much lower than in the military area. Second, in the United States there is a halo effect from outstanding technology developed in the non-defense area. The Boeing 747 is an example. At a Paris air show a couple of years ago the 747 was shown for the first time. The Soviet aircraft designers present were given a special tour of the airplane and were obviously impressed. This sort of thing undoubtedly impacts upon the Soviet technological community generally, and the military R&D community in particular, affecting their assessment of the relative position of U.S. and Soviet technology generally. One payoff from U.S. technologically more

sophisticated weaponry, even if it does not work well at times, is that Soviet observers are likely to feel that they still lag behind. The people in the design bureaus are especially likely to feel this way, even if their products may be operationally fully adequate, perhaps militarily superior.

(U) However, to return to a key question posed earlier with regard to R&D strategy: Where can the United States afford to trail the Soviets in military technology? Given a Soviet R&D effort of comparable scale to that of the United States, it seems inevitable that a lead or parity cannot be maintained in all areas. The United States will have to choose to trail the Soviets in some areas. How can it best trail? If there are diminishing returns of scale to investing resources in certain technological areas, the trailer should be able to keep up with the leader. But there are intelligence and information asymmetries. The Soviets can trail more efficiently, in all likelihood, because of the more open U.S. society and their superior ability to penetrate U.S. organizations with agents. Of necessity, the United States will have to develop an enhanced capability to trail efficiently in some areas.

Force Posture Programming (U)

(U) To some extent the United States can probably force certain expenditures on the Soviet Union. Since Soviet military force planners have resource and bureaucratic constraints, it may be possible to induce allocations of resources away from things that may be especially threatening. This points up the fact that Soviet reactivity to U.S. decisions presents both a problem and an opportunity. One goal is a certain level of stability in the strategic arms competition; but others are the reduction in the efficiency with which the Soviets use resources in their military programs and the steering of the evolution of Soviet posture in directions preferred by the United States. Preliminary studies suggest that the coupling of U.S. and Soviet decisions is complex and not uniformly strong. Adequate stability seems not too difficult to achieve, and there is some opportunity to influence Soviet decisions selectively. In particular, preliminary studies

suggest that Soviet budgeting exhibits a tendency toward relatively fixed shares by mission area and probably by organizational entity. This tendency has been especially strong since 1960. It limits Soviet tradeoff options as they react to U.S. decisions and thereby tends to increase the predictability of the impact of induced Soviet program changes and U.S. leverage. However, we need to know more about the U.S.-Soviet interaction process to assess these possibilities clearly.

(U) A general principle in all competition is that a good competitor should not allow his opponent to impose high costs on him without extracting comparable costs in return. The Soviet SS-9 deployment is a case where the United States has failed to compete well. The United States should not allow the Soviets to develop a hard-target kill capability, while forgoing the development of comparable capabilities in order to hope to induce the Soviets to limit their program. There is no evidence that U.S. restraint will lead to that result. Moreover, the effect in the long run is to reduce the comparative effectiveness with which U.S. resources are used. A hard-target kill capability forces expensive countermeasures on the other side (while the possessor may escape similar expenditures), or forces the abandonment of the threatened system and thereby the loss of capabilities and past investment. Stability is a goal, but not the only one. Over the long run one cannot allow his opponent consistently to use his resources more effectively and efficiently. Achieving stability is not the same as ending the competition. The United States and the Soviet Union will be pursuing conflicting national goals for the foreseeable future. Once this state of affairs is accepted, it is perfectly good policy and obviously good strategy to try to be the more efficient competitor.

(U) Once one begins to think in terms of a U.S. strategy for the long-term competition, it is natural to adopt a point of view contrasting starkly with current force posture planning analyses. We begin to focus on such questions as: What are areas of advantage? What problems does the other fellow have? How can the competition be moved into areas of U.S. advantage or Soviet disadvantage? This approach leads naturally to better risk balancing in U.S. force posture planning.

(U) The Soviet Union has overtaken the United States in the strategic forces area, as regards both force size and level of resources expended. Continuation of some of the analytic procedures and ways of thinking about how to design a strategic force posture, developed when the United States was far ahead (as regards both existing forces and level of resources expended), tends to make the United States a poor competitor today. In the past the United States could afford to employ a rich man's strategy against a weaker opponent. This can no longer be done. With an essentially fixed stream of resources to use in developing, procuring, and operating strategic forces, a continuation of high-cost hedges against all possible threatening developments will soon exhaust the totality of available resources. The United States has a tendency to spend little to specifically prepare for some of the higher-probability contingencies, and to spend nothing to prepare for favorable contingencies, or on moves designed to complicate Soviet problems. The heavily conservative bias of past analysis procedures can no longer be afforded.¹ In particular, more attention must be paid to producing relatively favorable outcomes rather than concentrating solely upon warding off the worst outcomes.

(U) If one's competitor allocates his resources to the more likely contingencies, in most circumstances his forces will be better prepared. Better risk balancing among the various future contingencies that U.S. strategic forces must deal with is essential to efficient use of resources. One has to be as good as or better than his opponent in allocating limited resources to cover the various risks, especially if comparable amounts are being spent on strategic arms. Indeed, we

¹(U) See John Hammond, Defense Decisionmaking: Prudent Versus Excessive Conservatism, R-715-PR, The Rand Corporation, July 1971. This report argues that current analysis procedures are excessively conservative and offers an alternative method of treating the uncertainties that are involved in decisions regarding future force posture. However, if one distinguishes between U.S. analysis procedures and U.S. decision-making processes, the crucial decisionmaking processes are not entirely characterized by excessive conservatism. Important risks may be ignored, and often are. Some assumptions may, indeed, be excessively optimistic. The general procedures Hammond recommends would push in the direction of improving the analysis (and, it is hoped, decisionmaking) by a more forthright and consistent treatment of uncertainties.

need to view the problem of designing U.S. force posture programs as part of a two-sided competition in which the efficiency of expenditure of two essentially fixed resource streams over an extended period of time is a critical factor.

(U) As regards force posture planning, where are the U.S. comparative advantages? Advanced technology has been an area of U.S. advantage, but the margin will be slimmer than in the past and confined to fewer areas of substantial advantage. Even to maintain this position will undoubtedly require an improved U.S. R&D policy, as suggested above. Another area of U.S. advantage probably is the ability to exploit rapidly changing technology. In part this area of comparative advantage comes from the organization of the U.S. military forces. U.S. forces are organized primarily as three Services, each of which encompasses various suborganizations and commands to accomplish many missions. This leads to role-and-mission competitions among the Services. These competitions are normally deplored. However, there are positive benefits. A look at the problem from the point of view of long-term competition with the Soviets might highlight some of these. It might also permit the rationalization of these competitions in ways that would make them still more productive. In contrast, Soviet forces are organized into five Services, and these Services into Branches, each narrowly oriented to a particular function or mission. Moreover, the training and career patterns of Soviet military officers are focused narrowly within Branches. Except for those who reach the very top of the military establishment, officers spend their careers within one Branch. This means that certain kinds of tradeoffs are not easily addressed within the Soviet system, or rather less easily addressed than within the U.S. system. From the point of view of long-term adaptation or responding to changing technology, the U.S. form of organization may be superior to that of the Soviets. However, this hypothesis needs judicious study and appraisal. But if true, the United States can take actions that are unlikely to be quickly countered because the role or mission may fall between the cracks of the more strictly functionally defined Services and Branches of the Soviet military organization.

(U) There may be similar structural and organizational anomalies in the Soviet R&D area. In any case, if we knew more about Soviet military organizations, how they function, how they perceive us, what stimuli provoke a response, we might be able to take advantage of this knowledge. All of this, of course, is a question of comparative advantage. Clearly, there are imperfections in U.S. responses to opportunities offered by new technology. The point is that the Soviets may have greater problems. A conscious U.S. strategy for the long-term competition might try to increase and exploit these advantages.

(U) Very generally, the United States will have to outthink the Soviets since it is doubtful that it will continue to outspend them substantially.¹ Soviet GNP growth plus an apparent willingness to spend what appears to be a stable 10 percent of GNP on defense, as well as what appear to be some areas where they are more efficient than the United States, make outspending them look unattractive. In any case, U.S. willingness to allocate resources to defense is declining, at least in the short run, and may stabilize at 6 to 7 percent of the GNP. Outthinking and outmaneuvering the Soviets is not impossible. It is useful to note that most comparative advantages in the modern world are the result of past investment, superior organization, and better management of resources. Relatively unchanging cultural factors may influence the capabilities of social groups to organize and motivate individuals effectively, but there is no reason to believe that American culture is inferior in this area.

(U) It is possible to invest in superior organization and in improved inputs for decisionmaking. In a prolonged competition, as in chess, the player who sees more deeply into the position, who sees which moves build strength into his position or complicate the problems of the opponent, ultimately obtains a dominant position. If we understand the interaction process better than the Soviets, we have some

¹(U) However the United States clearly has the capacity to outspend the Soviets substantially in periods of recognized crisis. Indeed a substantial deterrent to some sorts of Soviet behavior probably exists because of the latent capability the United States has to initiate an allout arms race, in which its large, flexible economy would perform impressively.

leverage in creating and exploiting areas of comparative advantage. If the United States can foresee better the useful technologies to develop and how to adapt its force posture to take advantage of them, it can spend its resources more efficiently than the Soviets. And if it can improve defense organization so as to harness the efforts of component organizations more effectively to national goals, U.S. resources may be spent more efficiently than those of the Soviets.

STRATEGIC THEMES (U)

(U) The above discussion has tried to suggest some ways in which approaching decisions within the framework of a strategy for the long-term arms competition would differ from those that dominate current decision processes. They would:

- o Seek for U.S. advantages
 - Attempt to steer the competition into areas of U.S. comparative advantage.
 - Maintain existing, and develop new, areas of comparative advantage.
- o Broadly improve the efficiency of U.S. resource use in acquiring and operating strategy forces
 - Improve decision processes, especially those focused upon risk balancing, in pursuit of multiple goals in the face of the many uncertainties that influence choices of strategic force programs.
 - Mount long-term efforts to achieve superior organization and management of relevant organizations -- military forces as well as important economic sectors, such as the aerospace industry.

(U) In particular, effective strategies would differ from the overly conservative and defensive decision processes that now dominate. As the Soviets overtake the United States in resource expenditures on strategic forces, U.S. decision processes must involve more conscious risk-taking.

(U) Looking only for bad things that could happen implicitly gives the initiative to the opponent. A more balanced approach would also include looking for the opponent's weaknesses and exploiting them, and preparing to capitalize on favorable events. Moreover, as Herbert Goldhamer suggests, good strategy does not dictate that all decisions be closely tied to some immediate objective:

(U) One does not win a chess game by always electing moves that are directly aimed at trying to mate the opponent or even at winning a particular piece. For the most part, the aim of a move is to find positions for one's pieces that (a) increase their mobility, that is, that increase the options open to them, and decrease the freedom of operation of the opponent's pieces; and (b) impose certain relatively stable patterns on the board that induce enduring strength for oneself and enduring weakness for the opponent. If and when sufficient positional advantages have been accumulated, they generally can be cashed in with greater or less ease by tactical maneuvers (combinations) against specific targets that are now no longer defensible or only at terrible cost.¹

The U.S. strategy for the long-term strategic arms competition should resemble this chess strategy. Soviet military programs already appear to be characterized by these strategic themes.

¹(U) Goldhamer, The Soviet Union in a Period of Strategic Parity, p. 7.

IV. DEVELOPMENT OF APPROPRIATE ANALYTIC METHODS AND IMPROVED INPUTS
FOR FORCE POSTURE PLANNING IN ACCORDANCE WITH A STRATEGY FOR
LONG-TERM COMPETITION (U)

(U) Full implementation of a change in the framework of strategic analysis would require the development of new methods for the analysis and programming of force postures. This probably would involve a shift in the focus of force posture analysis from optimal force postures to force programming strategies. The analysis undertaken to assist decision-makers would attempt to construct and evaluate alternative programming strategies for the long-term strategic arms competition. These programming strategies would consist of a set of decision rules to guide future behavior.

(U) In specific terms, such programming strategies would be statements telling what the United States will develop and what it will deploy as a function of the evolving strategic environment. Such an approach to analysis in the strategic area would address key problems of current and near future decisions, and it is hoped they would incorporate a more effective treatment of relevant uncertainties than is typical of current force posture analysis.

(U) Current studies tend to focus on comparing alternative force postures in 1975 or 1980 against a predicted range of Soviet postures. Studies comparing programming strategies would emphasize families of programs reaching into the future, with specific decision points related to changes in Soviet political and military posture, or to technological developments, in both the United States and the Soviet Union. Such studies would look for ways to construct flexible programs rather than to try to predict the strategic environment ten to fifteen years into the future and to program U.S. forces in accord with these predictions.

(U) It is difficult to describe what sorts of changes in analytical methods, or in analysis inputs, would be required to implement this sort of an approach to force posture planning. The following appear to be important areas to consider for further development:

(U) 1. Force-posture-planning gaming should be explored as a major analysis tool for force posture planning. Gaming would allow

more freedom to use complex criteria of the sort required to test proposed force posture programs against: (1) the multiplicity of U.S. goals in the long-term competition, (2) the wide range of scenarios and situations in which U.S. strategic forces are relevant. Force posture games also have the advantage that they bring out clearly the mutual and gradual evolution of U.S. and Soviet force postures and, through repeated play with differing assumptions about Soviet decision processes and technology, allow the testing of the adequacy of U.S. policies and programs to provide insurance, in a prudent and efficient fashion, against uncertain future developments. Moreover, the gaming format highlights the two-sided nature of many problems -- that is, the budgeting constraints and entrenched bureaucratic positions on both sides.

(U) The games might be similar to the Rand SAFE game and the more recent XRAY game, but they could be played in many different modes. In some cases they could be one-sided games, with control supplying the environment for a team constructing strategies for future decision-making regarding U.S. strategic forces. But force posture games are equally well adapted to the development of improved estimates of alternative courses of development of Soviet strategic force postures when played as two-sided games. Force posture games represent the best foreseeable way for constructing Soviet force postures that fully embody what we probably can know about the behavioral patterns of the complex of Soviet military-political-industrial organizations involved. Current intelligence estimating methods tend to construct Soviet postures as though they were under the control of some central, unified planning apparatus. On the contrary, the Soviet posture, as well as our own, emerges from a complex decisionmaking environment, within which there are many distinguishable organizations, each with its different goals and an ability to influence the final outcome. Two-sided games could produce interesting and important insights into the range of plausible Soviet force posture developments and provide an environment for the construction and evaluation of the sophisticated U.S. policies or strategies for competition with the Soviets over the next five to ten years. Moreover, the impact of China and other nations

upon U.S. and especially Soviet strategic forces can be introduced more easily than in current forms of force posture analysis. The impact on Soviet strategic force planning of U.S. tactical forces based near the Soviet Union could also be reflected.

(U) In summary, the force posture planning game is a promising and flexible tool. The players can use a more complex and rich set of criteria to judge the adequacy of their force postures than standard systems analysis allows. The complex risk balancing required to implement programming strategies, too, can proceed more easily.

(U) 2. Much development effort has gone into techniques for decisionmaking under uncertainty. In particular, Bayesian methods allow improved risk balancing, producing prudent rather than excessive conservatism.¹ These techniques, which have been adapted to business decisionmaking, might be applied, at least experimentally, to some selected area of defense decisionmaking.

(U) Current analytical methods tend either to assume away uncertainty or to compensate for it through conservative biasing of threats and other inputs. Quite possibly the practices were appropriate in the past, when many of the techniques and methods of systems analysis were developed. Throughout the 1950s and most of the 1960s, the Soviets, for reasons that are not adequately understood, did not channel sufficient resources into strategic forces to compete strongly with U.S. programs. Over most of the period, the United States was in the position of a rich competitor designing future capabilities to counter those of a poor competitor. It had sufficient resources to take out insurance against a wide range of uncertainties in the behavior of its opponent. The United States is no longer in this fortunate position in the design of strategic forces.

¹(U) See H. Raiffa, Decision Analysis: Introductory Lectures on Choices Under Uncertainty, Addison-Wesley, 1968; and Hammond, Defense Decisionmaking. See also D. E. Emerson, UNCLE: A New Force-Exchange Model for Analyzing Strategic Uncertainty Levels, R-480-PR, The Rand Corporation, November 1969, for one of the few (if not the only) efforts to accommodate uncertainties directly into analysis of strategic force postures. Emerson's work deserves much more attention than it has received thus far.

(U) In the future as Hammond suggests, new ways of dealing more explicitly with uncertainty will be required. Roughly speaking, Bayesian analysis tries to introduce intuitive judgments and feelings directly into the formal analysis of a decision problem. How these methods could be applied to defense decisions, if at all, needs study. But a Bayesian approach seems promising.

(U) 3. Some changes in intelligence estimates and other inputs to force posture analyses will be required that present alternative Soviet force posture trends, and incorporate improved models of Soviet decision processes. We must take more account of the fact that Soviet force posture emerges from a complex governmental decisionmaking process.

The U.S. intelligence community is not now in a good position to make the required improvements. Not enough is known about the Soviet military bureaucracy and relevant decision processes; collection of new types of information is in order. Moreover, what could be known now is not fully used.

(U) The use of different intelligence analysis methods will be required. New intelligence estimating or threat-projection techniques are needed that would allow the construction of a set of possible Soviet postures, with assigned probabilities. They are needed to provide a basis for better balancing of future risks. Good strategies for the long-term competition will include responses to the expected course of Soviet posture evolution, hedges against less favorable developments, and preparations to take advantage of the more favorable developments.

(U) 4. Improved methods for net assessment are desirable -- a constant monitoring of how we are doing relative to the Soviets would provide an important input to decision processes involved in implementing U.S. strategy for the competition. Such assessments should include an analysis of the comparative efficiencies with which we and the Soviets are using the resources devoted to relevant strategic force postures programs.

Any attempt to provide improved net assessments will produce new requirements for intelligence collection and analysis. U.S.

intelligence has focused on quantitative aspects of force posture elements and estimates of technical quality. Less effort has gone into obtaining information on operational practices, readiness levels, and other aspects of Soviet forces important to assessing military effectiveness. How to go about comparing U.S. and Soviet forces poses many problems. Initial efforts to produce net assessments will have to develop new methods and adapt currently available techniques. If net assessment becomes a regular part of the U.S. decision process, summary indices will have to be devised to reflect how the United States is doing relative to the Soviets. Problems have to be simplified in order to deal with them, especially in a routine manner. We are probably going to have to settle for a small set of indicators of the state of the long-term competition. Moreover, we may want indicators whose values can be estimated four or five years into the future.

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(U) The development of new methods of force posture analysis, new methods of intelligence analysis, new estimating procedures, and the like take many years. They are long-lead-time items for a full attempt to apply the suggested approach to strategic analysis. However, some of the items deserve further effort in any case. Improved intelligence on Soviet decision processes is desirable whatever approach one takes to the design of U.S. forces. Several of the other items can also be defended as useful in themselves.

V. NEXT STEPS (U)

(U) What are the next steps in developing this framework for strategic analysis? The following are suggested:

- (U) 1. Undertake substantive studies of such key areas as:
- a. The history of the strategic arms competition since World War II.
 - b. The nature of the interaction process between U.S. and Soviet strategic force postures, leading to the development of more sophisticated hypotheses and models of that process.

(U) 2. Develop the argument for the inevitability of the continuing, long-term, strategic force posture competition. Although most readers of this report would agree that such a competition is almost inevitable, it will be important to make the case convincingly to a wider audience. The argument as far as one can see it now would include the following points:

- a. Any prospective arms control agreements would be partial in nature. Because of verification problems and other pressures, there will be continuing programs of military R&D on strategic arms. They will provide a continuing stream of improvements in current systems and new systems in both the United States and the Soviet Union.
- b. Continuing civilian R&D, although at a slower pace, will also increase the options available on both sides.
- c. The high status of the Strategic Rocket forces and the PVO within the Soviet military establishment makes it almost inevitable that they will continue to get a substantial part of the Soviet military budget and to use those resources to develop their capabilities.

The studies conducted under item 1 on the history of the strategic arms competition will probably provide the basis for a considerably improved set of arguments concerning the likely continuing character of that competition.

(U) 3. Develop well-articulated formulations of U.S. goals for the long-term strategic arms competition. This is undoubtedly a key area with a big payoff, both in clarifying U.S. objectives in the competition and in providing a framework for arguing against those who stress single goals, or only a few goals as the basis for the design of U.S. strategic forces. The fact that needs to be established is that there are multiple goals and that tradeoffs are required among them. Moreover, if it is granted that the United States is in a long-term competition with the Soviets, one objective is to be an effective, efficient competitor.

(U) 4. Develop new analytical methods, to include:

- a. Bayesian methodology for improved risk balancing.
- b. Force posture gaming techniques.
- c. Net assessment methodology.
- d. Improved intelligence estimates.

(U) The priorities among these are as follows:

(U) 1. Initiate substantive studies of the strategic arms competition since World War II, in particular the interaction process between the U.S. and Soviet strategic postures. Full completion of such studies might take two or more years, but when finished should furnish a well-documented case that:

- a. The strategic arms competition is not unstable. Soviet reactions to U.S. moves stretch out over many years.
- b. U.S. restraint in level of effort, or with regard to specific areas of weapons technology, is unlikely to produce Soviet restraint.
- c. Interactions can be useful as well as threatening. To some extent it is possible to steer the competition in ways that reduce the efficiency with which Soviet resources are used, or to steer the competition into areas of U.S. comparative advantage.

Pieces of the study should be published as completed and should provide useful argumentation as they appear. If possible, an unclassified version

of the history of the arms competition and hypotheses concerning the interaction process should be produced so as to reach Congress and the public. The field cannot be left to the arms control enthusiasts and their exaggerated views of the "arms race."

(U) 2. Develop preliminary arguments as to:

- a. The inevitability and nature of long-term strategic arms competition.
- b. Appropriate U.S. goals in that competition.

From this can be generated useful argument and rebuttal against current views regarding arms race stability as a dominant goal and against decisions that shut off the development of counterforce and warfighting capabilities more generally.

(U) 3. Further assess possible new analytical methods required to implement changed decision procedures. These are long-lead-time elements, and some effort now may repay itself later. The application of Bayesian methods to defense problems could usefully be assessed by reviewing their use in business decisions and perhaps by experimental use on some chosen defense decision problem. Consideration should be given to reviving the development of force posture gaming methods through the restarting of past efforts.



DEPARTMENT OF THE AIR FORCE
WASHINGTON, DC

30 March 2010

HAF/IMIO (MDR)
1000 Air Force Pentagon
Washington, DC 20330-1000

RAND Corporation
1776 Main Street
P.O. Box 2138
Santa Monica, CA 90407-2138

(U) Reference your letter, dated 11 July 2005, requesting a mandatory declassification review for the following documents:

Explanation and Prediction of Governmental Action: An Organizational Process Model (U), Confidential, RM-5897-PR, May 1969

On improving Midterm Estimates of Soviet Military Capabilities for Use in United States Military Planning (U), Secret, RM-2892-PR, August 1962

Long-Term Competition with the Soviets: A Framework for Strategic Analysis (U), Secret, R-862-PR, April 1972

(U) The appropriate Air Force agency, Central Intelligence Agency (CIA) and the Defense Intelligence Agency (DIA) reviewed the attached documents and have no objection the declassification and release of the documents.

(U) Address questions concerning this case to the undersigned at 703-692-9979 and refer to case number 05-MDR-065.

Sincerely

JOANNE MCLEAN
Mandatory Declassification Specialist

2 Attachments

1. Reviews
2. Documents for Review (S)



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON, DC

JAN 17 2006

MEMORANDUM FOR AF/XOEC *af*
HAF/ICIOD (MDR)
IN TURN

FROM: AF/XOS-N

SUBJECT: Mandatory Declassification Review (MDR) Request, Case 05-065 (U)

(U) We reviewed the documents that comprise this case and determined their public release would not adversely affect current Air Force nuclear operations; therefore, we do not request to withhold any portions of the documents from release.

(U) This case contains several RAND reports: "Long-Term Competition with the Soviets: A Framework for Strategic Analysis" (April 1972), "Explanation and Prediction of Governmental Action: An Organizational Process Model" (May 1969), "On Improving Midterm Estimates of Soviet Military Capabilities for Use in United States Military Planning" (August 1962). The purpose of these reports is to offer an intellectual framework for thinking about the nature of the competition between the United States and the Soviet Union during the Cold War. Since the reports mention strengths and weaknesses of intelligence estimates, we recommend the Central Intelligence Agency and Defense Intelligence Agency review this case.

(U) Contact Mr. Bruce M. Sugden, AF/XOS-NO, at DSN 225-4856 if you have any questions.

A handwritten signature in black ink, appearing to read "James L. Hyatt", is positioned above the typed name.

JAMES L. HYATT, Col, USAF
Deputy for Nuclear Operations and Launch
Dir for Strategic Security DCS/Air and Space Operations

Attachment:
MDR Case 05-065 (S)

Central Intelligence Agency



Washington, D.C. 20505

November 10, 2009

Ms. Joanne McLean
Mandatory Declassification Review Manager
HAF/ICIOD
1000 Air Force Pentagon
Washington, DC 20330-1000

Reference: EOM-2006-00351 / Case 05-MDR-065 (Bancroft, Richard)

Dear Ms. McLean:

Your memorandum of 6 April 2006 referred three documents (No. R-862-PR, RM-5897-PR, and RM-2892-PR) to this agency in response to the referenced Executive Order 12958 mandatory declassification review request. A copy of your correspondence is enclosed at Tab A.

We have completed our review and have determined that with regard to CIA equities the documents may be declassified and released in full. Enclosed at Tab B are copies of the documents with appropriate markings.

Sincerely,

A handwritten signature in cursive script that reads "Delores M. Nelson".

Delores M. Nelson
Information and Privacy Coordinator

Enclosures
Tabs A and B



DEFENSE INTELLIGENCE AGENCY

WASHINGTON, D.C. 20340-5100



S-9,593/DAN-1A(FOIA)

MAY _ 9 2006

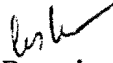
TO: Department of the Air Force
HAF/ICIOD
ATTN: JoAnne McLean
1000 Air Force Pentagon
Washington, D.C. 20330-1000

SUBJECT: Mandatory Declassification Review Request of Rick Bancroft
Your case #05-MDR-065, Our Case #MDR-072-06

DIA has reviewed the enclosed documents and has no objection to their declassification and release to the requester.

FOR THE DIRECTOR:

- 2 Enclosures
1. Request letter (U)
 2. Documents 1- 3 (S)

Margaret A. Bestrain 
Chief, Public Access Branch



1776 MAIN STREET
P.O. BOX 2138
SANTA MONICA, CA
90407-2138

TEL 310.393.0411
FAX 310.393.4818

11 July 2005

TO: Department of the Air Force
HAF/ICIOD (MDR)
1000 Air Force Pentagon
Washington, DC 20330-1000

SUBJECT: REQUEST FOR MANDATORY DECLASSIFICATION REVIEW AND
PUBLIC RELEASE

Please review the attached documents for declassification review and public release. The documents are:

- Explanation and Prediction of Governmental Action: An Organizational Process Model (U), Confidential, RM-5897-PR, May 1969.
- On Improving Midterm Estimates of Soviet Military Capabilities For Use in United States Military Planning (U), Secret, RM-2892-PR, August 1962.
- Long-Term Competition with the Soviets: A Framework for Strategic Analysis (U), Secret, R-862-PR, April 1972.

The author, A. W. Marshall, requests this review.

Two copies of each report are enclosed.

Your assistance in expediting this review is greatly appreciated. If you should have any questions, please contact Richard "Rick" Bancroft, (310) 393-0411 Ext. 6632 or e-mail: Bancroft@rand.org

Sincerely,

Richard Bancroft
Supervisor, Classified Library, RAND Corporation

THIS LETTER IS UNCLASSIFIED

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