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The Strategic Defense Initiative in Soviet Planning and Policy

Benjamin S. Lambeth, Kevin N. Lewis

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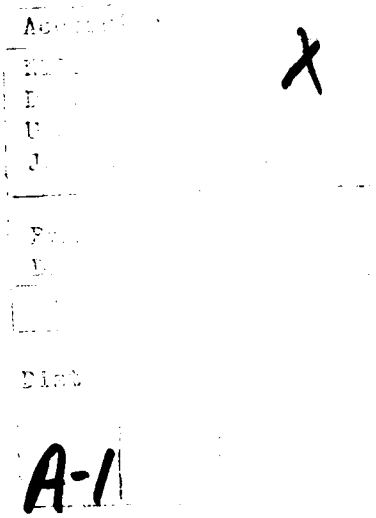

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This report analyzes the nature and depth of Moscow's concern about the Strategic Defense Initiative (SDI) and its implications for future Soviet responses. The authors consider the political-military and technical issues raised for the Soviets by SDI. The study assesses the Soviet declaratory stance on SDI; reviews the evolution and current state of Soviet attitudes toward homeland defense; summarizes key trends in Soviet antiballistic missile and antisatellite technology; considers the actual concerns that may underlie Moscow's propaganda line on SDI; reviews the range of technical responses the Soviets have said they might undertake; and examines the various political, strategic, institutional, and economic determinants that will shape whatever counter-SDI choices the Soviets ultimately adopt.

PREFACE

Since early 1985, The RAND Corporation has been providing analytical support to the Assistant Chief of Staff for Intelligence, Headquarters U.S. Air Force, on the question of possible Soviet responses to the U.S. Strategic Defense Initiative (SDI). This effort has sought to explore Soviet policy toward SDI in terms of those aspects of doctrine and strategy, offensive and defensive force requirements, internal resource decisions, arms control behavior, and international conduct that could have a reciprocal bearing on U.S. security.

This report is the final product of that undertaking. Its intent is to offer a contextual backdrop against which to evaluate various Soviet alternatives for dealing with SDI in the decade ahead. The report first examines the main points outlined in the large body of Soviet public statements on SDI to date. Next, it reviews the highlights of *Soviet* doctrine and programs related to strategic defense. It then considers the real concerns that may underlie the Kremlin's public posturing on SDI and outlines the key political, economic, and strategic factors that will constrain and direct whatever SDI responses the Soviet leaders ultimately select. Although the report is not primarily concerned with technical issues or any detailed forecasting of Soviet response alternatives, it does provide a set of notional options aimed at bounding the list of possibilities available to the Soviet leadership. It also offers some estimative judgments, by way of conclusion, regarding the most plausible Soviet reactions in a variety of SDI contingencies.

The analysis presented here is a considerable expansion of two earlier RAND studies written in connection with the project described above: Benjamin S. Lambeth, *The Soviet Union and the Strategic Defense Initiative: Preliminary Findings and Impressions*, N-2482-AF, June 1986, and Kevin N. Lewis, *Possible Soviet Responses to the Strategic Defense Initiative: A Functionally Organized Taxonomy*, N-2478-AF, July 1986. The report also incorporates highlights of additional research conducted by RAND colleagues Alexander Alexiev, Rose Gottemoeller, and Gregory Hildebrandt. The analysis has been informed at various points by impressions gained during a visit by a RAND delegation to the Institute of Space Research, USSR Academy of Sciences, in Moscow in November 1986 at the invitation of the Institute's director, Academician Roald Sagdeyev.

This report was prepared in the National Security Strategies Program of Project AIR FORCE. It should be of interest to U.S. Air

Force, Department of Defense, and other national security officials concerned with SDI, U.S.-Soviet strategic interaction, the arms control process, and trends in Soviet military doctrine and policy.

SUMMARY

Since its announcement in March 1983, the Strategic Defense Initiative (SDI) has increasingly dominated Western debate over international security. It has also prompted a vocal and concerned Soviet response. Although much of this rhetoric has been self-serving and propagandistic, Moscow's commentary has also reflected deeper worries about SDI and what it may mean for the strategic nuclear balance.

The Soviet campaign against SDI did not begin in earnest until more than a year after President Reagan announced the program. This delay reflected Soviet preoccupation with other concerns, most notably an effort to derail NATO's scheduled intermediate nuclear force (INF) modernization in response to the earlier Soviet SS-20 deployment and other adverse trends in the theater nuclear balance. Moscow's shift toward SDI as a full-time preoccupation did not occur until the former effort failed with the deployment of Pershing II and ground-launched cruise missiles (GLCM) to Western Europe in December 1983.

A major factor accounting for this shift in Soviet attention was the progress shown by SDI itself. With the establishment of the Strategic Defense Initiative Organization (SDIO) in early 1984, SDI assumed a corporate existence that went well beyond the level of Presidential rhetoric. The Reagan administration further signalled its determination by earmarking $26 billion for a five-year SDI research program. Finally, several displays of American technological prowess, including the successful firing of an antisatellite technology demonstrator into space from an F-15, caused the Soviets visible consternation. These events convinced the Soviets that SDI was more than a passing phenomenon and called for a serious Soviet response.

The central allegation of Soviet propaganda has been that SDI is not, as advertised, intended merely to ensure U.S. survival, but to back up a U.S. war-winning posture aimed at depriving the Soviet Union of any significant retaliatory capability. Much of this rhetoric has misrepresented SDI in an effort to play on U.S. domestic controversy and to inflame the worst fears of our European allies. Among other things, it has suggested that the Soviet Union has forsworn any involvement in ballistic missile defense (BMD). This claim is contradicted by long-standing Soviet operational doctrine, as well as by a substantial BMD program of the Soviet Union's own. Nevertheless, Moscow's commentary on SDI has

relentlessly insisted that since the signing of the ABM Treaty in 1972, the Soviet Union has changed its view on the question of homeland defense. By thus appearing to put the onus for starting a "new arms race" on the United States, this refrain has given Moscow an inside track in the propaganda war.

This tendentious public rhetoric, however, does not mean that Moscow privately views SDI with equanimity. **The main source of Soviet agitation with regard to the near term has to do with the possibility that SDI may undermine worldwide respect for Soviet military prowess if allowed to continue, whatever technical problems it may encounter along the way.** Military power is the foundation of the Soviet state. Moreover, the Soviets have paid a lot for their strategic posture over the past 20 years. In some ways, that posture is more important to their international standing than their entire network of allies and clients around the world. **Insofar as SDI aims, in President Reagan's words, to render nuclear weapons "impotent and obsolete," it threatens—at least from the Kremlin's vantage point—to render worthless the very basis of the USSR's superpower status.**

Considering the numerous other force modernization efforts of the Reagan administration, **SDI is probably viewed by the Soviets as yet another indication that the United States has become a determined adversary again, after years of comparatively slack involvement in the arms competition. The Soviets are probably not nearly so fearful of an increased danger of war emanating from SDI as their statements would have us believe. It is quite plausible, however, that they view SDI as a major threat to their own concept of deterrence by denial.**

Even a less than leakproof American BMD would undermine Moscow's considerable investment in hard-target ICBM development over the past two decades. Significant American SDI progress could also have undesirable implications for other aspects of the military competition, including the enhancement of American nonnuclear forces. Finally, SDI could be viewed by Moscow as a threat to convert America's technological edge into a practical advantage and leave the USSR well behind in the competition. **The Soviets have reaped great propaganda benefits from those American scientists who have insisted that SDI will never work. Yet the remarkable outpouring of Soviet effort to subvert the program constitutes strong evidence of a deep Soviet concern that it will work only *too* well—or well enough to compel heavy Soviet spending in an anxious atmosphere.**

The most probable Soviet short-term approach toward countering SDI will be a continued effort, already well under way, to neutralize the program politically before it gains enough inertia to present a tangible threat. A major component of this campaign has been Moscow's attempt to exploit the natural yearning of Americans for arms control by enticing the public with a variety of tantalizing force-reduction "proposals," while playing for time in the negotiating arena in the hope that the administration's position on SDI will be forced to yield under the pressure of public opinion. This suggests that the Kremlin's arms control posturing remains in a highly tactical phase. But it also dramatizes Moscow's desire to eliminate SDI on the cheap, if at all possible, by helping to engineer its demise before hard commitments toward offsetting Soviet programs become required.

Should this political assault against SDI prove unavailing, Moscow will have to turn to more tangible responses. It is too early to say yet what those responses might entail. However, we can identify some of the factors that will influence whatever choices the Soviets adopt. One such influence will be the prospects and limitations of Soviet science and technology. Here the Soviets will be working at a significant disadvantage. According to a recent report by the Under Secretary of Defense Research and Engineering, the United States is equal to or superior to the Soviet Union in the 20 most important areas of technology associated with space-based ballistic missile defenses. Compounding this insufficiency is a shortage of Soviet management expertise and organizational efficiency. The ingrained inertia of the Soviet military R&D bureaucracy will increase the likelihood that any Soviet effort to counter SDI will involve a difficult struggle.

Moscow's response will also be affected by the extent to which SDI is eventually allowed by the United States to become a bargaining counter in the arms control arena. Thus far, it has consistently been stated U.S. government policy that SDI research and testing permitted by the ABM Treaty will not be extended as a bargaining chip, regardless of any reciprocal concessions the Soviets might offer. Yet the administration understands the enormous potential of SDI to drive Soviet military programs away from directions uncongenial to Western security interests, as attested by the eagerness of Moscow's arms control offerings to date. It is not inconceivable, therefore, that after hanging tough long enough to smoke the Soviets out in the negotiating arena, the administration (or its successor) may become more inclined to consider certain SDI constraints as an acceptable trade for an arms control breakthrough that imposes countervailing restrictions on the most disturbing trends in Soviet ICBM development.

Beyond the capabilities and limitations of Soviet science and technology, over which the United States has little direct control, and the vagaries of the arms control process, which could render the whole question of Soviet SDI responses moot, there are other factors that will influence Moscow's reactions to SDI. One will turn on how Soviet planners assess SDI in light of previous American involvements in homeland defense. Although the Soviet leadership will face many problems in countering a determined SDI effort, this difficulty may be eased somewhat by the fact that the United States has not shown a notably impressive record of sustaining military programs, especially controversial strategic ones, that have required the support of multiple budget cycles to come to fruition. This has especially been the case with respect to strategic defense.

Since the dawn of the nuclear age, "deterrence by punishment" has been a central focus of American nuclear policy. In effect, the threat of retaliation has been almost universally perceived in the United States as the only dependable means for deterring a Soviet attack. Accordingly, **a major theme of U.S. defensive planning has concerned assuring the viability of our nuclear counterattack options. This may go far toward explaining the almost reflexive Soviet depiction of SDI as a natural outgrowth of alleged American "first-strike" ambitions.** U.S. defenses over the past three decades indeed *have* shown a strong pattern of having been pursued mainly to help get our offensive forces out of harm's way in case of war. Yet in this subordinate role, defenses have also been the first to go when budgets have become tight or Americans have identified higher military or social priorities. Consequently, **a knowledgeable Soviet observer would not be making predictions wildly out of keeping with the historical record if he bet on the low staying power of SDI over the long run.**

Offsetting such a Soviet inclination, however, may be the fact that there are enough unique circumstances surrounding SDI to raise a fair question in the mind of a Soviet planner about the validity of past U.S. trends as a basis for projecting future American behavior. On the one nand, the Soviets know that the next administration may not share the same enthusiasm for SDI as the current one does. Yet SDI is unfolding in the context of a novel bureaucratic setting in the American homeland defense experience. In this regard, the formation of the SDIO has been a notable development in Soviet eyes. Among other things, the emergence of that organization may appear to the Soviets as a sign of unprecedented bureaucratic support for strategic defense. It may also, in their view, portend

greater programmatic coherence, efficiency, and relative standing for SDI in comparison to past American strategic defensive undertakings.

Ultimately, it will be the fiscal priority that the U.S. government accords to SDI over time that will convince Soviet observers whether or not there has been a changed tune compared with previous approaches. A Soviet planner familiar with American defense activities over the past four decades would be on solid ground in believing that SDI, as presently conceived, may change dramatically in its characteristics and goals, or that the program could see extensive slippage of key development and procurement decisions—and perhaps even outright cancellation. Yet any such hope must give Soviet planners cold comfort in light of the remarkable persistence SDI has shown since President Reagan announced it four years ago. In either case, the smart Soviet planner will probably put his rubles on some forecast dominated by a failure of SDI to follow any roadmap currently in vogue.

Moscow's response to SDI will also be influenced by Soviet domestic politics and processes. Here, the presence of a strong General Staff able to impose top-down direction on the weapons acquisition process will tend to minimize the tugging and hauling over programs and budgets that often characterize interservice rivalries in Western countries, the United States not excluded. To this extent, we should expect a reasonably coherent and disciplined Soviet response, whatever technical form it may assume. Yet notwithstanding the moderating influence of the General Staff on purely bureaucratically motivated solutions, it remains likely that whatever countermeasures the Soviets select will reflect the clout of those institutions (particularly the Strategic Rocket Forces) with the greatest interests at stake.

Moscow's reaction to SDI will be heavily contoured by long-standing doctrinal proclivities. Here, the important point concerns the likelihood of Moscow's acceding to any arrangement that seeks to replace the current offense-dominated strategic environment with a new one characterized by robust defenses on both sides. Some proponents of SDI have suggested that Soviet participation in such a transition should be rendered that much easier by what they regard as the "natural" preeminence of the defensive mission in Soviet military thought. Unfortunately, **although the Soviets place great weight on home defense, that emphasis has typically occurred within the context of a continued parallel stress on the indispensability of overwhelming offensive forces. For that reason, Soviet participation in any cooperative venture aimed at redefining the existing strategic landscape seems remote.**

Perhaps the most important factor that will govern how Moscow reacts to SDI involves the question of resource constraints and the inevitable difficulties that will arise over allocation priorities as the Soviets attempt to grapple with this challenge. After two decades of force expansion, the Soviets are now finding themselves more and more saddled with real limits to attainable military growth. Since 1976, there has been a pronounced decline in Soviet productivity. To deal with this problem, Gorbachev has proposed greater support to the machine-building industry, particularly that part concerned with electronic engineering, machine tools, and computers and instruments. However, at least in the immediate years ahead, these investment areas in the civilian sector will be obliged to compete directly with the development and production of high-technology strategic systems.

Accordingly, the prospect of having to react to SDI confronts the Soviets with some uncongenial policy choices. **Analysis based on assumed dollar-ruble exchange ratios for high-technology weapons development and production has shown that a Soviet offsetting response to a notional U.S. BMD network employing space-based kinetic kill vehicles could force the Soviets to spend the equivalent of some $12 billion over two decades to maintain any significant offensive force penetrativity.** Although this estimated cost would constitute only a small fraction of overall annual defense outlays by the Soviets, it would nearly equal the expenditure that would be required to fund a critical nonstrategic program, such as upgrading the Soviet Air Force's fighter inventory with the MiG-29. For this reason, the Soviets will face difficult tradeoffs in reconciling the likely costs of countering SDI with their strong determination to keep pressing ahead in conventional arms modernization.

Should the Soviets choose to counter SDI with an emulative response, the cost burden could increase by an order of magnitude or more, depending on the efficiency of the selected response. Such a program would also compete directly with Gorbachev's commitment to shoring up the domestic economy because of the drain it would impose on Soviet high-technology resources. **This could prove self-defeating for the Kremlin if it turned out that successful economic modernization was a precondition for any effective emulation of SDI.**

On balance, Moscow has accepted SDI as a challenge it cannot allow to go uncovered. Yet the record of Soviet behavior regarding the issue since 1983 has been mixed. The leadership was slow to react to SDI at first. Yet by 1985, SDI had become the centerpiece of Soviet-American relations. Among other things, it was

pivotal in inducing the Soviets to return to the Geneva arms talks, which they had walked out of unilaterally in November 1983 over INF. More recently, Soviet statements on SDI have radiated a less anxious tone in consonance with the mounting troubles that the program has begun to encounter on the American domestic scene. **As the fortunes of SDI have become more and more buffeted by fiscal constraints and technical pressures, the Soviets appear to have adopted a more relaxed public posture. Clearly they remain hopeful that the program can be brought to an early demise politically. But there is little evidence that Moscow senses any need, at least yet, to begin gearing up for a crash effort to counter SDI, especially in the absence of any clear indication as to what SDI itself may ultimately entail.**

Three generic clusters of SDI "fates" can be identified. First, one can foresee a situation in which SDI progresses on a sustained basis for a decade or more. In this scenario, SDI would not be dri.en by (and subordinated to) external forces. On the contrary, it would proceed roughly in the direction originally intended in President Reagan's March 1983 speech, even though the specific phases, technologies employed, military context, and other factors might prove very different from those that scenario writers in the mid-1980s thought most likely.

Second, there is the possibility that SDI could run out of steam in short order. With costs rising, political problems looming, other military priorities pressing, domestic turbulence growing, technological hopes not panning out, and other obstacles emerging, the administration succeeding President Reagan could choose to cut its losses and terminate the original ambitious SDI plan. This would not necessarily preclude SDI from realizing *some* payoff, possibly even a significant one, for such applications as antitactical ballistic missile defenses for NATO or some sort of terminal defense for vulnerable national command centers and ICBMs. However, the nationwide scheme originally contemplated would be brought to an end in the fairly near term, perhaps before 1990.

Third, we can postulate a case in which SDI eventually collapses, but not b:fore inspiring substantial compensatory behavior on both sides. This scenario would combine the dominant features of the two outlined above. Here, defying the predictions of most critics, SDI would proceed apace for a number of years. An appropriate mix of technical achievement, budgetary commitment, adjustment to the ABM Treaty, alliance support, and public opinion would deny Moscow any confidence that SDI could be easily manipulated into oblivion or onto some side track.

It would be entirely speculative at this point to predict which of these SDI "futures" has the greatest likelihood of occurring. But it is not so difficult to assess their relative gravity in Soviet eyes or to anticipate probable Soviet reactions in each case. **Undoubtedly the Soviets are continuing to direct their main efforts today toward helping to engineer the second of these contingencies, namely, the early political dissolution of SDI.** Should those efforts fail, the Soviets will feel mounting pressure to begin laying the foundations of an infrastructure capable of supporting at least those longer lead-time items that will be required for any serious SDI countermeasure scheme. Even then, however, the Soviets will have ample time to continue monitoring the direction and progress of SDI. They will also be able to wage a continued rear-guard effort to subvert SDI politically in the hope that the third scenario noted above might be realized, namely, a gradual dissipation of SDI after substantial progress has been made on both sides.

A full-fledged breakout from the ABM Treaty is often cited as a possible Soviet option in the face of a persistent SDI effort. Such a development seems unlikely. For one thing, there is the disproportionate element of cost associated with any such option compared with more modest offsetting measures. Beyond that, emulating SDI at the expense of overcoming it would be inconsistent with the long-standing offensive focus of Soviet military doctrine. Finally, a Soviet ABM breakout is a remote prospect simply because of the great extent to which the USSR has been able to improve its BMD technology base *within* the constraints of the ABM Treaty. By pursuing such a strategy, the Soviets would risk strengthening support for SDI in the United States and Western Europe and thereby hastening precisely the development they had sought to avoid in the first place.

Even the need to pursue an offsetting response may not be as pressing on the Kremlin as many in the West assume. Soviet planners recognize that SDI could follow such an erratic and unpredictable course that they would waste a lot of money were they to commit themselves prematurely to any programmatic response. Moreover, the Soviet leaders are well aware that despite the confident rhetoric of President Reagan, SDI is on less than firm political and technical footing in the American domestic arena.

Nevertheless, the American threat to deploy SDI trades heavily on the promise of a variety of technologies in which the United States is widely acknowledged to maintain a substantial lead. Insofar as the Soviets recognize this American advantage and harbor respect for American technological prowess, their real short-run concern is that SDI will deprive the considerable Soviet nuclear

posture of much of its *political* utility. **It is this generic affront that SDI presents to Moscow's sense of position in international affairs that, first and foremost, lies at the heart of the Soviet leadership's current discontent over the program.**

All things considered, that discontent seems real enough (and sufficiently tied to known Soviet resource constraints) to suggest that the United States can hardly go wrong by continuing to play its SDI card closely, pending a more confident determination of just how much the Soviets might be willing to pay in the coin of offensive arms reduction to head it off. **In conjunction with other trends in U.S. nuclear and conventional force modernization, SDI has placed the United States in perhaps a stronger bargaining position relative to the Soviet Union than at any time since the Kennedy-McNamara buildup of the early 1960s. In light of the compound dilemmas that SDI has put before the Soviet leadership, an important challenge facing the U.S. government is to develop a strategy that brings SDI into parallel with our diplomacy toward the Soviet Union so that we might elicit the greatest political leverage from it, even as we continue to press for a validation of the many technical concepts it is exploring.**

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CONTENTS

ABBREVIATIONS

AAA	Antiaircraft Artillery
ABM	Antiballistic Missile
ADTAC	Air Defense Tactical Air Command
AFB	Air Force Base
ALCM	Air-Launched Cruise Missile
ASAT	Antisatellite
ATB	Advanced Technology Bomber
ATBM	Antitactical Ballistic Missile
BMD	Ballistic Missile Defense
C3I	Command, Control, Communications, and Intelligence
CIA	Central Intelligence Agency
CSOC	Consolidated Space Operations Center
ECM	Electronic Countermeasures
FY	Fiscal Year
GLCM	Ground-Launched Cruise Missile
GNP	Gross National Product
ICBM	Intercontinental Ballistic Missile
INF	Intermediate Nuclear Forces
KGB	Soviet Committee for State Security
MAD	Mutual Assured Destruction
MIRV	Multiple Independently Targeted Reentry Vehicle
MRBM	Medium-Range Ballistic Missile
MT	Megaton
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organization
NCA	National Command Authority
OTH	Over the Horizon
PKO	Soviet Antispace Defense
PRO	Soviet Antimissile Defense
PVO	Soviet National Air Defense
R&D	Research and Development
RDT&E	Research, Development, Test, and Evaluation
RPI	Rocket-Propelled Interceptor
SAC	Strategic Air Command
SAM	Surface-to-Air Missile
SDI	Strategic Defense Initiative

SDIO	Strategic Defense Initiative Organization
SLBM	Submarine-Launched Ballistic Missile
SLCM	Submarine-Launched Cruise Missile
SRAM	Short-Range Attack Missile
SRBM	Short-Range Ballistic Missile
SRF	Soviet Strategic Rocket Forces
SSBN	Nuclear Ballistic-Missile Submarine
SSGN	Nuclear Cruise-Missile Submarine
USAF	United States Air Force
VPK	Soviet Military-Industrial Commission

I. INTRODUCTION

Since its announcement by President Reagan on March 23, 1983, the Strategic Defense Initiative (SDI) has dominated Western discourse on international security. In the words of one commentator, it has created a "cottage industry of analysts, theorists, arguers, and debaters" and has given rise to "more intellectual effort and concern than anything else to do with strategic nuclear forces in the last decade and a half."[1] During the course of this debate, issues have been addressed ranging from technical feasibility to fiscal practicality and the implications of SDI for America's alliance relations and the strategic nuclear balance.

In hindsight, it is not surprising that SDI has provoked such controversy. Broadly speaking, the program entails a far-ranging effort to validate new concepts and technologies for ground-based and space-based defense against ballistic missiles that might, in the President's words, eventually render these weapons "impotent and obsolete."[2] Although some critics initially dismissed it as merely another passing fad of American defense policy, SDI has shown remarkable staying power since its inception. Already, it has consumed nearly $10 billion in U.S. defense spending, an unprecedented amount for what remains, at least thus far, entirely a research effort.[3] Furthermore, apart from the question of cost, even a modest deployment of ballistic missile defenses along the lines envisioned by SDI would contravene the 1972 Antiballistic Missile (ABM) Treaty. It would also generate major

[1]Robert E. Hunter, "Star Wars Erodes Confidence in Nuclear Waiting Game," *Los Angeles Times*, February 27, 1985. The last American debate of comparable magnitude occurred in 1969 in connection with the Nixon administration's effort to win Congressional support for its SAFEGUARD ABM program.

[2]President Reagan, "Address to the Nation on Defense and National Security," March 23, 1983, in *Public Papers of the Presidents of the United States, Ronald Reagan 1983*, Book I (Government Printing Office, Washington, D.C., 1984), pp. 442-443. A vast literature on SDI has emerged in the four years since the program was first announced. We cannot begin to account for that literature here. For a balanced compendium that presents a variety of responsible views on the subject, however, see Steven E. Miller and Stephen Van Evera (eds.), *The Star Wars Controversy* (Princeton University Press, Princeton, New Jersey, 1986). See also Robert M. Lawrence, *Strategic Defense Initiative: Bibliography and Research Guide* (Westview Press, Boulder, Colorado, 1987).

[3]The original funding level sought for SDI by the Reagan administration for FY 1985-89 was $26 billion. And at a requested increment of $5.4 billion, SDI was the single largest line item in the FY 1987 defense budget submitted to Congress, almost double the next largest request of $2.8 billion for Navy and Marine Corps F-18 fighter procurement. See James Gerstenzang, "Star Wars Leads All Defense Costs," *Los Angeles Times*, July 13, 1986.

reverberations in every other area of U.S. national security policy. And the pivotal role SDI played at the Reykjavik summit in 1986 attested to how far the program had come in galvanizing the attention and concern of the Soviet Union. Clearly SDI has moved to the forefront of East-West arms control diplomacy. According to one prominent account, it has evolved since its inception four years ago into "the single most powerful force affecting Soviet-American relations."[4]

Given SDI's potentially revolutionary implications for the strategic balance, the Soviet Union has had plenty to say about the issues outlined above. Although much of its commentary has been self-serving and propagandistic, the Kremlin's pronouncements have also reflected deeper apprehensions about the program and what it may suggest regarding broader U.S. intentions. For that reason, it is not enough to treat Moscow's rhetoric and behavior merely as "the Soviet reaction to SDI." The entire scope of Soviet foreign and strategic policy stands to be affected. The fact that SDI has so dominated Soviet rhetoric and conduct since its inception in 1983 speaks powerfully of its potential for influencing a broad range of Soviet interests in both the near term and the longer haul.

Yet for all the crossfire over the so-called "Star Wars" issue in the American domestic debate, little attention has been paid to the Soviet side of the equation. Granted, considerable efforts have been expended to anticipate likely Soviet military countermeasures to SDI. Over the past four years, numerous groups within the U.S. government and elsewhere have sought to predict the programmatic and hardware responses that the Kremlin might pursue in an effort to evade, emulate, or neutralize possible future American strategic defenses. Yet in the rush to itemize and contemplate the various *technical* options available to the Soviets, only a few analysts have paid much attention to how Moscow perceives SDI as a strategic problem or what it portends for Soviet foreign and defense policy more broadly defined.[5]

This oversight needs correcting, since both the programmatic and policy dimensions of Moscow's response to any U.S. SDI effort will be critical in determining the ultimate practicality and fate of the program. Insofar as Soviet planners regard SDI as a significant threat to the Kremlin's security interests, their expectations will also affect the amount of leverage SDI will offer the West over Soviet force deployments and arms control behavior. For both reasons, it is vital that we understand the nature and depth of Moscow's concerns about SDI and its implications for the full scope of possible Soviet responses.

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[4]"Star Wars at the Crossroads," *Time*, June 16, 1986, p. 16.

[5]See, for example, Stephen M. Meyer, "Soviet Strategic Programs and the U.S. SDI," *Survival*, November-December 1985, pp. 274–292

The present report aims to illuminate these larger questions. It does not concentrate on technical issues so much as on other factors that will shape the context within which the Soviets will frame their responses to SDI as the latter evolves during the decade ahead.[6] Although the analysis includes an overview of Soviet defensive weapons trends relevant to SDI, it is not an exercise in technological or programmatic forecasting. Rather, we are concerned with the larger political-military issues raised for the Soviets by SDI.

The study begins with an assessment of the Soviet declaratory stance on SDI since the latter was first announced by President Reagan in 1983. It then reviews the evolution and current state of *Soviet* attitudes toward homeland defense. Following that, we present a summary of key trends in Soviet ABM and antisatellite technology, with a view toward highlighting the contradiction between long-standing Soviet development activities and Moscow's more recent assertions of commitment to stability based on mutual vulnerability. Next, we consider the private concerns that may underlie Moscow's propaganda line on SDI; review the gamut of technical responses that the Soviets have publicly stated they might undertake; and examine the various political, strategic, institutional, and economic determinants that will shape whatever counter-SDI choices the Soviet leaders ultimately adopt. In the last two sections, we present a notional menu of response options that might offer the greatest appeal to Soviet planners. We then conclude with an estimate of how SDI has affected Soviet behavior thus far and how it is likely to influence Soviet conduct in the coming decade and beyond.

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[6]Throughout this study, we use "SDI" to refer not only to the American initiative in its own right, but also to the collection of deployed systems and operational concepts that might emerge under its aegis. Thus to "defeat SDI" might refer either to Soviet efforts to undermine the program politically, militarily, or otherwise, or to military and technical means for neutralizing systems deployed as a result of SDI, depending on context. The term is used only in reference to American, not Soviet, efforts.

II. THE SOVIET DECLARATORY LINE ON SDI

Moscow's failure to react immediately to President Reagan's March 1983 address suggested that the Soviets, like most Americans, were caught off guard by the announcement.[1] The first rejoinder by General Secretary Andropov came only four days after the President's statement, indicating that the Kremlin needed more than the usual amount of time to put its official thoughts together.[2] The Soviets may also have been unsure about how seriously the President's remarks should be taken, inasmuch as they appeared to catch most of the American national security bureaucracy by surprise as well. Soviet America-watchers could have reasonably wondered, for example, whether the announcement, which was so quickly mocked by the U.S. media, was not just another fleeting idea like "dense pack" basing for the MX.

As one might have expected, Andropov made a special point to characterize the President's speech as yet another manifestation of Washington's alleged hope to reestablish military superiority over the Soviet Union. In this respect, SDI was linked to earlier administration comments on "prevailing" in nuclear war and similar notions that, in the Soviet portrayal, reflected an American strategic policy at best irresponsible and at worst downright fiendish. Yet Andropov's remarks also contained other points that were to become recurrent themes in the subsequent Soviet line on SDI. Most prominent was the charge that SDI was not, as advertised, "defensive" in intent, but rather indicated an accelerated American effort to acquire a nuclear first-strike capability against the Soviet Union.[3]

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[1]It has been reported, for example, that the morning after the President's address, Deputy Secretary of Defense Paul Thayer gathered his staff and asked: "O.K., what are we going to do about this mess?" Frank Greve, "Lee Iacocca of Air Force Is Star Behind Star Wars," *Miami Herald*, September 7, 1986. See also Robert Scheer, "Star Wars: A Program in Disarray," *Los Angeles Times*, September 22, 1985.

[2]This hesitant character of Moscow's initial reaction to SDI was consistent with the similar, if less exceptional, pattern of Soviet comportment in the wake of the downing of Korean Airlines Flight 007 five months later, an event that probably came as no less of a rude surprise to the top Kremlin leadership.

[3]"Yu. V. Andropov's Answers to a *Pravda* Correspondent's Questions," *Pravda*, March 27, 1983. The Soviet leader repeated this line a month later in an interview with *Der Spiegel*, when he took umbrage at SDI's emphasis "on impunity, on delivering the first nuclear strike thinking they [the Americans] can protect themselves from the answering strike." Andropov added: "From here it is not far from the temptation to reach out for the firing button. This is the main danger of the new American military concept." TASS communique in English, April 24, 1983.

Before reviewing the details of Moscow's propaganda campaign against SDI, we should note that this endeavor was rather slow to get started. In contrast to the apocalyptic tone that came to dominate Soviet rhetoric once the campaign reached its peak, SDI was treated with relative equanimity by the Soviets for nearly a year after President Reagan announced it. Although the President's proposal was routinely met with a prompt rejection by Andropov, the full Soviet campaign against SDI did not materialize in earnest until much later.[4] Apart from the likelihood that the Soviets did not know quite what to make of SDI during the initial months following its announcement, this delay probably reflected Soviet preoccupation with other concerns, notably the Kremlin's effort to derail NATO's scheduled implementation of its intermediate nuclear force (INF) modernization in response to the earlier Soviet SS-20 deployment and other adverse trends in the theater nuclear balance.

In sharp contrast to Moscow's later insistence that SDI was a "mortal enemy" of peace and arms control, the President's initiative was generally mentioned only perfunctorily during this period. For example, a prominent interview with the Soviet Defense Minister, Marshal Ustinov, just four months after President Reagan's SDI speech dwelled heavily on such American weapons as MX, Pershing II, and ground-launched cruise missiles (GLCM), yet devoted but a single aside to SDI.[5] Likewise, an article the previous month contrasting U.S. and Soviet military policy by then-Deputy Chief of the General Staff Marshal Akhromeyev made no reference to SDI whatever.[6]

Beyond that, SDI at the outset had no discernible impact on Moscow's negotiating conduct at the Geneva arms talks. When the Soviets walked out of those talks in November 1983, it was INF, not SDI, that was the precipitating factor. At the time the President announced SDI, the Soviet propaganda machine was fully cranked up to exploit West European protests against NATO's impending INF deployments. That campaign offered Moscow high hopes of upsetting the security consensus of the Western alliance by spurring the antinu-

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[4]Only a few analyses of the Soviet declaratory response to SDI have noted this fact. See, for example, John Greer Nicholson, *Pravda's Assessment of the Strategic Defense Initiative Late 1984 and Early 1985*, Staff Note 8509, Directorate of Strategic Analysis, Operational Research and Analysis Establishment (Department of National Defense, Ottowa, Canada, December 1985).

[5]"Answers by Marshal of the Soviet Union D. F. Ustinov, USSR Defense Minister, to Questions of a TASS Correspondent," *Pravda*, July 31, 1983.

[6]"We Must Not Allow Any War: The Doctrine of Aggression and the Doctrine of Peace," *Pravda* (Bratislava), June 23, 1983.

clear movement, which by then had picked up impressive momentum.[7] The Kremlin's optimism was further bolstered by the simultaneous growth of a nuclear freeze movement in the United States, which threatened to hobble numerous administration defense programs at about the time SDI was announced.

Clearly, then, apprehension over INF and a determination to exploit the antinuclear movement were among the Soviet Union's top foreign policy concerns when SDI began its first stirrings. For the Soviet leaders to have become overly fixated at that instant on what no doubt struck many Kremlin observers as an administration pipe dream may have been deemed both inappropriate and counterproductive, partly because it could end up being an overreaction to an American false starter and, even worse, because it might have drawn attention away from more urgent Soviet business.

Moscow also may have been reluctant to allow an ill-timed propaganda assault against SDI to dilute West European agitation over NATO's INF deployments, the Kremlin's more immediate concern. Beyond that, some in the Soviet Union may have regarded SDI in its early months as a clever American ploy to emasculate the freeze movement by promising to replace assured destruction with a more "moral"-sounding strategy based on defense. As late as the summer of 1985, well after the Soviet anti-SDI campaign had entered full swing, one commentator averred in this regard that the Reagan administration was "worried that the mounting movement . . . for freezing nuclear arms" threatened its offensive force modernization ambitions and thus saw "in a program nominally designed to strengthen strategic defense . . . an opportunity to counter this movement."[8]

For these reasons, Moscow's interest in SDI as a propaganda issue did not fully solidify until the Soviet campaign against INF had failed unequivocally with the deployment of Pershing II and GLCM in December 1983. As just one side indicator, the Kremlin did not immediately move in the wake of President Reagan's 1983 speech to argue that developments in such exotic areas as lasers and directed energy would violate the ABM Treaty. That refrain emerged only later, once the anti-SDI campaign was well established. Indeed, not until October 1985, after the Reagan administration announced its support for a broad interpretation of the ABM Treaty to allow certain SDI research, did the Soviet Union begin expressing its interest in a more restrictive interpretation.

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[7]For further discussion, see Alexander R. Alexiev, *The Soviet Campaign Against INF: Strategy, Tactics, Means*, The RAND Corporation, N-2280-AF, February 1985.

[8]R. Ovinnikov, "Star Wars Program: A New Phase in Washington's Militaristic Policy," *International Affairs*, August 1985, pp. 18–19.

Whatever the case, it was only in the middle of 1984 that the Soviet declaratory stance on SDI began to change from one of relative equanimity toward the beginnings of an all-out campaign. Several factors accounted for this transition. First was the rapid dissipation of the European peace movement in the wake of the initial deployments of Pershing II and GLCM. Additional wind was taken out of Moscow's sails when a Soviet fighter shot down Korean Airlines Flight 007, a Boeing 747 with 269 civilians aboard, near Sakhalin Island during the early morning hours of September 1, 1983. This latter event went far toward undoing most of the progress the Soviets had made the previous year in presenting themselves as the party of "peace" in world affairs. Still other factors may have been the decline of the nuclear freeze movement in the United States and President Reagan's unrelenting support for SDI, which prompted a redirection of the internal American defense debate away from those offensive force issues that had most bothered the Soviet Union before the advent of SDI.

Perhaps most influential of all in focusing the Kremlin's attention, however, was the progress shown by SDI itself. With the establishment of the Strategic Defense Initiative Organization (SDIO) in early 1984 under the leadership of Lieutenant General James Abrahamson, a successful manager of several previous large aerospace programs (among them the Air Force F-16 and the NASA space shuttle), SDI assumed a corporate existence that went well beyond the level of Presidential rhetoric. The Reagan administration further signalled its determination by earmarking $26 billion for a five-year SDI research effort and by promulgating a National Security Council directive in January 1984 authorizing development activity in a variety of high-technology areas. Finally, punctuating these indicators that SDI was assuming real programmatic stature were several displays of American technological prowess that caused the Soviets visible consternation. These included the successful test of an antisatellite (ASAT) weapon fired into space from an Air Force F-15 in January 1984 and a launch the following June of a ground-based ABM, which successfully intercepted an incoming ICBM warhead 100 miles from its target near Kwajalein Atoll in the South Pacific.

Taken together, these events probably convinced the Soviets, perhaps even to their surprise, that SDI was more than a passing artifact of American defense politics. The result was a gradual shift by mid-1984 from Moscow's earlier derision of SDI as an American "Star Wars fantasy" to an emergent realization on the part of the Kremlin that the program was looming as a significant challenge that demanded a serious Soviet response. This shift in the Kremlin's outlook was starkly reflected in a June 1984 remark by a Moscow radio

commentator, who admitted that whereas most observers in the immediate wake of President Reagan's SDI speech were inclined to dismiss his idea as something "taken straight out of a Hollywood film production," matters had assumed a new light with the institutional, technical, and programmatic momentum that SDI had shown in subsequent months. "Now," he said, "with the United States putting forward a 20-year program of research and development aimed at creating something like the ultimate in nuclear fiction, a complex military system based in space and capable of disabling another country's nuclear missiles, it is no longer a matter for such irony."[9]

Although it is hard to say precisely when in the spring of 1984 the Soviet leadership decided to elevate its anti-SDI propaganda to the level of a full-fledged campaign, it had become clear by the middle of the summer that the Kremlin had embarked on a determined effort to cripple or destroy the program politically before it could gather enough momentum to render it irreversible. Of course, mounting a "campaign" of this sort to achieve some particularly sought-after policy goal has been a common technique of Soviet international behavior since the founding of the Soviet state. Among the more notable past examples were the Soviet campaign against atomic weapons in the late 1940s, against German rearmament in the 1950s, and against the neutron bomb in the 1970s. The singular determination of Moscow's anti-SDI effort and its centrality in Soviet propaganda rhetoric, however, have in combination revealed a Soviet desire to obstruct SDI that borders on the overwhelming. In the assessment of Stanislav Levchenko, a former KGB major well versed in Soviet covert operations who defected to the United States in 1979, "SDI is the number one point of Soviet propaganda now," and the Soviets can be expected to "try anything to kill SDI."[10]

One of the initial goals of this Soviet effort was to undermine the widespread American popular view that SDI was especially worthy of support because it was "defensive" rather than offensive in nature. In this regard, Moscow's chief Americanologist, Georgii Arbatov, rued the fact that "a great majority of Americans" had "expressed their solidarity with the fatal plans of the White House and the Pentagon" because of their having been taken in by the "deception that antimissile weapons, which are in reality first-strike weapons, were presented as

[9]Radio Moscow domestic service, June 22, 1984.

[10]Quoted in Tom Diaz, "SDI Top Soviet Propaganda Target, Ex-KGB Disinformation Expert Says," *Washington Times*, December 17, 1985.

defensive weapons."[11] In attempting to rectify such "dangerous misperceptions," the Soviets invoked a technique common to earlier campaigns by parroting the dissenting statements of prominent American critics of SDI. In addition to belaboring the theme that SDI is not "defensive" but rather represents the cutting edge of a prospective American first-strike capability, the Soviets have aired some related refrains (including contradictory ones), such as the notion that SDI is technologically infeasible, that it would have a deleterious effect on the economic well-being of the American people, that it will deal a "mortal blow" to arms control and international security, and so on.

Before long, Soviet pronouncements on SDI had come to reflect such internal consistency as to suggest that high-level guidance on approved language had been carefully coordinated and disseminated to all hands.[12] Despite the many controversial features of SDI, there has been no evidence, at least in public, either of conflicting Soviet "schools" on the subject or of any notable change in the official Soviet position, save for a toning down of the more virulent Soviet rhetoric coincident with Moscow's return to the Geneva arms talks in January 1985. On the contrary, the various signals emanating from Moscow show every sign of having been orchestrated to play up a number of common points. These signals have varied from reasonably straightforward articles in quasi-professional forums like the Soviet monthly journal *SShA* (*USA*) to unrestrained hyperbole from such Party spokesmen as Vadim Zagladin and Valentin Falin. In propounding them, the Soviets have made use of every available communications channel, ranging from the printed media to interviews with Western journalists and the citation of prominent Soviet scientists to add technical credence to Moscow's critique of SDI.[13] Their arguments have uniformly portrayed President Reagan's initiative as an American subterfuge for acquiring a war-winning capability. This, the Soviets allege, will bring the world closer to nuclear war—or at least to a much intensified and more dangerous arms race—by obliging Moscow to pursue offsetting measures whose result will be to render the strategic balance less stable.

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[11]Interview in *Rabotnichesko Delo*, December 30, 1984.

[12]A useful review of the key elements of this line, along with pertinent documentation, is presented in *The Soviet Propaganda Campaign Against the U.S. Strategic Defense Initiative* (U.S. Arms Control and Disarmament Agency, Washington, D.C., August 1986).

[13]See, for example, the conversation with Henry Trofimenko, a senior member of the Institute of the USA and Canada, reported in Robert Scheer, "Soviet Expert on U.S. Says Arms Talks May Be Modest Steps Toward Detente," *Los Angeles Times*, January 13, 1985. See also Academician Ye. Velikhov, vice president of the Soviet Academy of Sciences, "Ambitions in Space—Threats on Earth: Washington's Adventurous Course," *Pravda*, April 30, 1984.

Although there is clearly a pronounced manipulative element to this Soviet line, it also reflects genuine apprehensions that threaten unpleasant consequences with respect to possible future Soviet offensive and defensive arms deployments. Whether or not Moscow's stated concerns are uniformly justified, it is important that we understand them and take them into account in our own strategic and arms control planning. It is also essential, however, that we avoid the mistake of accepting at face value any and every Soviet utterance on SDI as a reflection of some underlying leadership "perception" that is being carefully transmitted for all the world to hear.[14] Although many of Moscow's avowed fears are real enough, a good deal of the Soviet Union's anti-SDI rhetoric has been contrived to make propaganda hay out of domestic controversy within the United States, to play on European nervousness, to deny Soviet involvement in comparable activity, and to project a Soviet devotion to mutual vulnerability as the only workable basis for a stable deterrent relationship. We will defer our assessment of what are most likely the *real* concerns of the Soviet leadership with regard to SDI for a subsequent section so that we might first draw out the more obvious propaganda aspects of the Soviet line.

The central allegation of Moscow's litany against SDI holds that the program's intent is not to "defend" the United States or permit the "elimination of nuclear weapons," but rather to underwrite an American disarming first-strike posture aimed at depriving the Soviet Union of an assured retaliatory capability.[15] General Secretary Gorbachev echoed this contention shortly after assuming office when he complained that the Americans "talk about defense but are preparing for an attack, they advertise a space shield but are preparing a space sword."[16] Along with such colorful accusations came a raft of remotely connected charges, including the argument that the United States developed Minuteman III as an out-and-out "first-strike" weapon.[17] Likewise overdrawn was the charge by Vadim Zagladin that SDI represents "a process of material preparation for war" and the claim by Georgii Arbatov that SDI's full deployment "will make war inevit-

[14]See, for example, Mary C. FitzGerald, "The Soviet Military on SDI," *Studies in Comparative Communism*, Autumn-Winter 1986, pp. 177–191.

[15]Representative of the genre was an editorial entitled "Large-Scale Provocation Against Peace," *Pravda*, March 23, 1984.

[16]Interview in *Pravda*, April 8, 1985.

[17]L. Semeiko, "Counting on Impunity: On the White House's New Militarist Concept," *Krasnaia zvezda*, April 15, 1983. In fact, the Minuteman III, even with the Mk 12A warhead, has a rather low overall damage expectancy against the full complement of Soviet ICBM silos.

able."[18] Behind such distortions, of course, undoubtedly lies a genuine Soviet apprehension that an American monopoly on space-based defenses will alter the strategic balance to the Soviet Union's *political* disadvantage, whatever one might say about the ultimate *military* implications of such a development. But that is a different matter.

A second argument against SDI holds that the President's initiative threatens a violation of "the spirit and letter" of the ABM Treaty.[19] Leaving aside Moscow's insistent denials of similar culpability,[20] there may be a grain of truth to this viewpoint if one is to assume inevitable full-scale SDI hardware development and certain types of testing. But there is nothing in the ABM Treaty that precludes pure research, and the U.S. government has gone out of its way to stress that SDI remains, at least for the immediate future, a research-only program. Indeed, in other contexts the Soviets themselves have pointed out that weapons research cannot be regulated, since it is unverifiable. Perhaps this is why Soviet propaganda has taken such pains to show that the United States is involved in *more* than just research.[21] In all events, Moscow has repeatedly cast SDI as a symbol of American indifference to the ABM Treaty and as a threat to derail "the whole process of arms control."[22] In their most outspoken moments, the Soviets have gone so far as to warn that "the militarization of space will cancel everything that has been accomplished in arms control."[23]

Beyond its insistence that the declared intent of SDI obscures a far more nefarious "true" intent, Soviet rhetoric has sought to exploit dissension among American opinion elites and to capitalize on European anxieties. On the first count, Soviet propaganda has rarely missed an opportunity to quote prominent American arms control proponents, whose criticisms of SDI have given the Kremlin a whole arse-

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[18]Vadim Zagladin, "The World Faced with a Choice," *Sovetskaia Rossiya*, December 27, 1984; and G. A. Arbatov, Radio Moscow international service, April 13, 1983.

[19]P. Pavlov, "Space: Washington's Words and Ambitions," *Izvestiia*, July 28, 1983.

[20]A representative example was the following remark by then-Soviet Defense Minister Marshal Sokolov, who insisted that Soviet military R&D is "not aimed at creating strike space weaponry, but is linked [only] with perfection of space early warning, reconnaissance, communications, and navigation systems." William J. Eaton, "Soviets Warn U.S. Against Space Defense," *Los Angeles Times*, May 6, 1985.

[21]Commonly cited as an example has been the American testing of an ASAT prototype launched from an F-15 fighter. But ASAT is not the same thing as an ABM, a distinction glossed over by the Soviets. They also fail to mention that the USSR was the pacesetter in this area and currently maintains the world's only operational ASAT.

[22]Interview with G. A. Arbatov, Radio Moscow international service, April 13, 1983.

[23]"For Space Without Weapons," *Pravda*, December 28, 1984.

nal of ammunition with which to snipe at the Reagan administration.[24] The Soviets have also made clever use of the widely noted contrast between SDI and the Apollo program, by pointing out that the latter was feasible because the lunar landing involved "merely a battle with the laws of gravity," whereas the Soviet Union can be expected to take "resolute countermeasures" against SDI.[25]

As for European attitudes, the Soviet press regularly echoes the oft-expressed concern that an effective SDI shield will decouple the American nuclear deterrent from Europe's defense by making Washington less inclined to support its allies in a crunch. A typical example was Valentin Falin's charge that the Americans speak solely of "strategic" defense, which concerns intercontinental missiles and conveniently ignores "tactical and operational [i.e., theater] nuclear weapons." Since "there are none of these near U.S. territory," Falin suggested, "their threats do not pain Americans' hearts."[26] Also reflective of this line was Vladimir Bogachev's dark portent of the steep price the "European peoples" will have to pay "while the Americans, under the umbrella of a space-based antimissile defense system, will manage to survive Armageddon taking place thousands of miles away from U.S. shores."[27]

Perhaps the most insidious aspect of Soviet polemicizing against SDI has been Moscow's effort to blame the United States for aggravating the arms competition while, at the same time, suggesting that the Soviet Union has forsworn interest in homeland defense. This pleading has been totally at odds with long-standing Soviet operational doctrine, to say nothing of an amply funded Soviet ABM development program and comparable investments in national air and civil defense. Nevertheless, Soviet propaganda in the wake of President Reagan's

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[24]See, for instance, Andrei Kokoshin, "Space Is Not an Arena for Confrontation," *Vek XX i Mir*, No. 12, December 1983, pp. 9-23; Vladimir Bogachev, TASS dispatch, December 26, 1984; and "Still the Same Stance," *Pravda*, December 30, 1984.

[25]Vladimir Matyash, TASS dispatch in English, December 27, 1984.

[26]"Space: The Moment of Truth," *Izvestiia*, December 14, 1984.

[27]TASS dispatch, December 26, 1984. Growing American and NATO European interest in exploring the possibilities of antitactical ballistic missile (ATBM) defense, either as a part of or distinct from SDI, has undermined this line of Soviet argument. Also, Moscow has been careful not to press the argument too far because of its recollection of having been burned by similar propaganda against INF. Perhaps the Soviets worry that popular European attitudes toward missile defense, like rank-and-file American views, may be less uniformly hostile than some Western press reports have suggested. In this regard, the *Wall Street Journal* several years ago castigated what it called "ventriloquist journalism" in creating a "growing balloon of distortion on 'European concern' over Star Wars." In this characterization, "a U.S. journalist with some special mind-set contacts three European elites, asks them a tendentious question and gets the expected tendentious answer. The headlines read 'Europeans Fear Reagan Plan,' as if a continental plebiscite occurred." "Star Wars and Europe," *Wall Street Journal*, February 12, 1984.

SDI speech has repeatedly implied that Moscow now embraces the logic of classic Western deterrence theory, with its emphasis on mutual assured destruction (MAD), whereas the United States has abandoned this worthy strategic outlook.

In this spirit, one commentator argued that although accidental wars are not impossible, a deliberate nuclear war is "simply inconceivable" under conditions of "genuine" deterrence stability of the sort assertedly provided by SALT I.[28] To support this line of argument, the Soviets have summoned the authority of their top scientists (and often ours) in proclaiming that "no effective means of defense exist in nuclear war."[29] As for the capacity of active defenses to protect large populations, Georgii Arbatov noted in passing how this "naive concept" was shared by "maybe even some people on our side at the beginning," implying that Soviet planners have since given it up.[30] His son Alexei, in a lengthy *SShA* article, added that although Soviet military thought had long embodied a deep strain of defense-mindedness, the Soviet leaders were not so foolhardy as to believe they could survive a nuclear war.[31] One could cite numerous variations on this theme. The point that matters, however, is that in developing its propaganda stance against SDI, Moscow has appropriated the language of mutual assured destruction as its own, while accusing *Washington* of seeking a damage-limiting capability and thus threatening to disrupt "the balance" that has hitherto prevented nuclear war.

Ironically, this contention is a virtual mirror image of the concern that has long been voiced by officials of both the Reagan administration and its predecessors over the threat dimensions of *Soviet* offensive and defensive programs that have been under way since about 1965. It is more than a little curious that the same Soviet scientists who have been at the leading edge of Moscow's campaign against SDI have also been long-standing participants in the USSR's own effort to develop a

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[28]L. Semeiko, op. cit.

[29]"Space Deceivers," *Argumenty i fakty*, September 20, 1983.

[30]Radio Moscow international service, April 13, 1983.

[31]A. G. Arbatov, "Limiting Antimissile Systems: Problems, Lessons, and Prospects," *SShA: ekonomika, politika, ideologiia*, No. 12, December 1984, pp. 16–28. The younger Arbatov showed remarkable ingenuity several months later in seeking a novel argument against SDI. In response to a query from a panel of West German interviewers as to why the USSR was so resolutely opposed to "Star Wars" if, as Soviet propaganda alleged, it not only was technically infeasible but also could drive the American economy into the ground, Arbatov replied that this was undesirable from the Kremlin's point of view, since Moscow knew that any such economic crisis would impose intolerable burdens on the American "proletariat," who would be the first to suffer from its effects! "Auch Inspektionen vor Ort sind Möglich," *Der Spiegel*, March 11, 1985.

defense against ballistic missiles.[32] Yet by putting the United States on the defensive with an argument that commands wide appeal among those Western critics inclined to believe it, this refrain has given Moscow an inside track in the propaganda war. Whatever one may think about the merits of SDI from a technical or policy perspective, this double standard in Soviet rhetoric must be recognized if the real meaning and worth of the program are to be properly debated.

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[32]For example, Academician Velikhov wrote in an opinion piece in the *Washington Post* on June 24, 1983, that strategic defense is "a dream that can't come true." Yet he is associated with the Kurchatov Atomic Energy Institute and, according to news reports, has been identified by the Central Intelligence Agency as a "central figure" in Soviet laser and particle-beam weapons research. The same is true of Nikolai Basov, another prominent Soviet anti-SDI propagandist, who was a 1964 Nobel laureate in quantum electronics and has evidently spent much of his professional life working on both conventional and exotic ballistic missile defense (BMD) technologies. See Lord Chalfont, "Moscow's Star Wars Plan: Keeping Facts Under Wraps," *Toronto Globe and Mail*, April 23, 1985; and Bill Gertz, "CIA: Soviets Are Developing Their Own Star Wars System," *Washington Times*, May 10, 1985.

III. STRATEGIC DEFENSE IN SOVIET MILITARY THOUGHT

The Soviets have worked hard since the end of World War II to build what is now commonly accepted to be the world's most extensive network of active aerospace defenses. The actual potential of this network has, on the whole, lagged considerably behind parallel advances in the threat posed by American and allied strategic offensive forces. This has not, however, resulted from any flagging of Soviet fiscal or programmatic support to the *principle* of homeland defense.[1]

Western analysts often dismiss this record as a case of Moscow's throwing good money after bad, or as a continued testament to the ability of the Soviet air defense establishment (*Voiska* PVO) to command a consistently high percentage of the Soviet military budget. Such arguments fail to appreciate the extent to which a deep commitment to homeland defense has held sway over Soviet military thought since the beginnings of the nuclear age. Although organizational and bureaucratic factors certainly account in part for the size of Soviet allocations to PVO, the main explanation for Moscow's stress on strategic defense must be sought in Soviet history and operational doctrine.[2]

Until recently, most American defense planners were inclined to accept as a given that any serious attempt to defend against nuclear attack, especially one employing ballistic missiles, would be wasteful, technically futile, and destabilizing to the strategic balance. Consequently, the prevailing view held that since nuclear war was inherently unsurvivable, the only reliable key to security lay in a protected retaliatory force that could threaten unendurable harm to the Soviet Union in response to any attack on the United States or its allies. This premise led to an American decision, first articulated during the Kennedy-McNamara years, to forgo further efforts at serious air defense, on the ground that it made little sense to commit resources against a modest Soviet bomber threat in light of the impossibility of handling a far more intractable Soviet ICBM challenge.

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[1]As an example, throughout the 1970s the dollar cost of Soviet homeland air defense activities was several times the dollar cost of U.S. strategic bomber activities. See *Soviet and U.S. Defense Activities, 1971-1980: A Dollar Cost Comparison*, Central Intelligence Agency, SR 81-10005, January 1981, pp. 3-8.

[2]A useful survey of postwar Soviet attitudes toward homeland defense is offered in Michael J. Deane, *Strategic Defense in Soviet Strategy* (Advanced International Studies Institute, Washington, D.C., 1980).

Even when the idea of ballistic missile defense had become more technically promising later in the decade, continued U.S. adherence to the MAD premise militated against any repudiation of basic strategic assumptions. This tendency was reinforced when it seemed that certain countervailing technical developments, such as MIRV, would be able to overwhelm the ABM systems that seemed then to lie within reach. Accordingly, what was initially little more than a cost-effectiveness case against further U.S. investment in *bomber* defense eventually became enshrined as a near-theological opposition to active defense of *any* sort.

Notwithstanding their accession to the ABM Treaty, the Soviets have, for their part, always preferred to adhere to the long-standing premise of their fundamentally *military* strategic doctrine that the best security guarantee lies in the capacity to defeat or neutralize the armed forces of any aggressor should war come. Although Soviet officials now routinely maintain (and most of them undoubtedly believe) that any nuclear war would be an unmitigated disaster for Soviet national livelihood, they nevertheless also believe that such a war remains possible. In practical terms, this has promoted a deep-rooted unwillingness to settle for a deterrent oriented solely toward retaliation. As Khrushchev put the point with elegant simplicity in his memoirs, "if the enemy starts a war against you, then it is your duty to do everything possible to survive the war and to achieve victory at the end."[3]

This doctrinal predilection does not, of course, bespeak any underlying Soviet confidence that such "victory" would actually be attainable, even in the most favorable circumstances of combat imaginable. It does, however, reflect a Soviet conviction that at least making every effort to survive a nuclear exchange, within the limits of Soviet economic and technical resources, remains an abiding responsibility of the Communist Party. This outlook has been a major factor in motivating the Kremlin's insistence on maintaining a large homeland air and civil defense establishment.

Of course, the Soviets do not assign absolute priority to homeland defense. Occasionally one encounters assertions from PVO spokesmen that "victory or defeat in war has now become dependent on how much the state is in a position to defend reliably the important objects on its territory."[4] The bulk of Soviet commentary, however, has long emphasized that the decisive role of protecting the homeland lies in the damage-limiting potential of the Soviet ICBM force. In short, strategic

[3]*Khrushchev Remembers*, translated by Strobe Talbott (Bantam Books, New York, 1970), p. 570.

[4]Marshal G. V. Zimin (ed.), *Razvitie protivovozdushnoi oborony* (Voenizdat, Moscow, 1976), p. 191.

defense is considered an independent *form* of combat, but not an independent *mission*. Instead, it is treated as an integral part of broader Soviet "all-arms" philosophy, which insists that no single service or weapon can, by itself, secure victory.

To some extent, this "all-arms" approach provides a convenient rationale for ensuring that all of the Soviet services retain a healthy piece of the action in the distribution of military roles and resources. In the main, however, its inspiration has been more operational than bureaucratic. At bottom, it reflects a conviction that the success of each service's performance will depend on how well the other services carry out their assigned tasks. The centrality of the offensive in Soviet strategy belies the notion propounded by some in the West that Soviet military thought is inherently defensive-minded. True enough, the memory of past invasions by Charles XII, Napoleon, Kaiser Wilhelm, the Western powers during the Civil War, and, most unforgettably, the Wehrmacht in 1941 has doubtless contributed to a special Russian concern for protecting the home front. Yet there is no mistaking the offensive character of Soviet military doctrine. Even PVO spokesmen acknowledge that in any major conflict, nuclear weapons will remain the "decisive means of warfare."[5]

Nevertheless, strategic defense occupies an important place in the hierarchy of Soviet military functions, and not merely as a means of helping to assure a Soviet retaliatory capability, as has been the case with traditional American thinking on home defense. This centrality of active defense in Soviet strategy is perhaps best attested by the distinctive status that has been accorded to PVO as a separate armed service since 1954. As Marshal Sokolovskii remarked nearly two decades ago, the initial offensive may "significantly reduce the opponent's means of nuclear attack," but "one cannot rule out that a certain number of the opponent's aircraft and missiles will nevertheless be launched" in reprisal.[6] Accordingly, Soviet planners recognize that a well-developed PVO posture "has also acquired great strategic significance and has become one of the most essential factors for ensuring the defense potential of the Soviet state."[7]

To be sure, the many efforts that have gone into modernizing Soviet aerospace defenses over the years have fallen far short of providing the USSR a credible war-survival posture, even in conjunction with

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[5]Colonel General M. Povaliy, "Scientific-Technological Progress and Military Art," *Vestnik protivovozdushnoi oborony*, October 1977, p. 18.

[6]Marshal V. D. Sokolovskii (ed.), *Voennaia strategiia*, 3rd ed. (Voenizdat, Moscow, 1968), p. 361.

[7]Marshal V. Kulikov, "Anti-Air Defense in the System of Defense of the Soviet State," *Vestnik protivovozdushnoi oborony*, April 1973, p. 4.

Moscow's formidable offensive damage-limiting capabilities. Indeed, air and missile defenses have been perhaps the *least* robust of any Soviet military investment area because of the inherent advantages that have traditionally fallen to the attacker in the interaction thus far between offensive and defensive technologies. Although the Soviet press occasionally voices confidence that PVO "is equipped with everything necessary for the defeat of an aggressor's surprise attack and for his shattering destruction,"[8] PVO missions are more typically stated conditionally, such as the following assertion by Marshal Kulikov that PVO "*must* ensure the protection of the country and armed forces from air and nuclear-missile attack . . . and prevent strikes on the most important objectives, force groupings, and naval forces."[9] Likewise, although PVO spokesmen occasionally make sweeping claims that their defenses "are capable of reliably destroying the opponent's aircraft and cruise missiles at any altitudes, at any flight speed, and in any meteorological conditions," they usually also concede that destroying low-altitude penetrators remains "a most important problem" and recognize that a comprehensive home defense has yet to appear.[10]

On the other hand, Soviet defense planning has never insisted on hundred-percent solutions. On the contrary, Soviet investment in homeland defense has been consistent enough over the past three decades to suggest a determination to cope with the full spectrum of enemy threats *despite* the impossibility of total success, simply on the ground that failure to make the attempt would be politically irresponsible. Repeatedly, we have seen energetic, if less than effective, Soviet efforts to anticipate *every* facet of the changing threat, ranging from bombers and cruise missiles to ballistic missiles and other space-related systems. In all cases, the abiding goal has been to preserve the "inviolability" of Soviet territory from "even one missile or one plane" and to repulse any attack so as to "ensure the uninterrupted work of the national economy, organs of state administration, and the combat capability of the armed forces."[11]

Obviously there will remain a substantial gap, at least in the immediate future, between this operational tasking and Moscow's ability to make good on it. Yet this discouraging prospect shows no sign of

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[8]Marshal P. Batitskii, "Sacred Duty," *Vestnik protivovozdushnoi oborony*, November 1977, p. 11.

[9]Kulikov, op. cit., p. 4.

[10]Marshal G. V. Zimin, "The Experience of the Great Fatherland War and the Present," *Vestnik protivovozdushnoi oborony*, October 1977, p. 106.

[11]Colonel N. Tabunov, "In the Spirit of Personal Responsibility," *Vestnik protivovozdushnoi oborony*, June 1975, p. 11; Lieutenant General N. Grishkov, "To Strengthen the Might of Air Defense," *Vestnik protivovozdushnoi oborony*, August 1972, p. 2.

being accepted by the Soviet leadership as valid ground to throw in the towel on the issue. Throughout the postwar era, the USSR has consistently sought to accommodate each changing element of the offensive threat, irrespective of the larger global political and diplomatic climate. This development pattern has stood at notable odds with Andrew Marshall's otherwise apt observation that the Soviet-American strategic interaction process has been "muffled, lagged, and very complex" in its hardware manifestations.[12] Even the ABM Treaty, although it imposed constraints on deployment, did not visibly shake Moscow's long-standing commitment to pressing the state of the art in ballistic missile defense research, whatever Moscow's post-SDI professions may suggest to the contrary.[13]

On this last point, it would leave the story unfinished not to place in context some recent intimations, not only by the Soviets but by some Western commentators, that the USSR has turned over a new leaf in its attitude toward the requirements of deterrence in the nuclear age. For example, taking at face value certain Soviet pronouncements since Brezhnev's Tula speech in 1977 repudiating any Soviet intent to acquire a "war-fighting" capability, former Secretary of Defense Robert McNamara opined several years ago that those tough-sounding Soviet writings of the 1960s that "were used so devastatingly by opponents of nuclear arms control" were now "badly out of date" and had been rendered irrelevant by what he saw as a major "doctrinal shift" reflected by the new post-Tula Soviet rhetoric.[14]

More recently, Georgii Arbatov sought to sustain such Western thinking with regard to ballistic missile defense in his effort to deny that Moscow *ever* took seriously the promise of its ABM program, let alone was intimately involved in any such program today. Dismissing Western allegations to the contrary as "big inventions," Arbatov conceded in a prominent interview that "there was some work done" at

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[12]Quoted in Graham T. Allison, *Essence of Decision: Explaining the Cuban Missile Crisis* (Little, Brown and Company, Boston, Massachusetts, 1971), p. 98.

[13]For example, between 1972 and 1976 alone, the Soviets reportedly conducted some 55 ABM test launches, including high-acceleration systems using both conventional and infrared guidance. Cited in Robert P. Berman and John C. Baker, *Soviet Strategic Forces: Requirements and Responses* (The Brookings Institution, Washington, D.C., 1982), p. 149.

[14]Robert S. McNamara, "The Military Role of Nuclear Weapons," *Foreign Affairs*, Fall 1983, pp. 65–66. For an elaboration on the faulty assumptions that we believe underlie this interpretation, see Benjamin S. Lambeth, "Has Soviet Nuclear Strategy Changed?" in Roman Kolkowicz (ed.), *The Logic of Nuclear Terror* (Allen and Unwin, Boston, Massachusetts, 1987), pp. 211–230.

one time, but insisted that it was "of very modest scope" and that the leadership "never had it in mind that it's possible to do it."[15]

Not surprisingly, the Soviet military press has been largely mute on the subject of ballistic missile defense since the signing of the ABM Treaty, and one no longer reads vigorous expositions on the operational aspects of home defense in any way resembling the doctrinal literature that existed on this issue over a decade ago.[16] Indeed, a RAND colleague has shown that Soviet commentary on ballistic missile defense effectiveness began to yield to "virtual silence and disclaimers" as early as the period immediately *antecedent* to SALT I.[17] Needless to say, this ability of the Soviet system to "vanish" an entire category of activity simply by rhetorical fiat has been a major boost to the Kremlin's effort to project an image of arms moderation to the outside world.

Nevertheless, Soviet activity in missile defense research has continued apace, as has the development of new technologies to counter U.S. airbreathing threats. Furthermore, there has not been the slightest indication that Moscow has repudiated the function of home defense in its strategic planning. One would, of course, naturally expect a decline in Soviet public comment on BMD in the wake of the ABM Treaty, in light of the regime's ample capacity to maintain discipline over its internal media. Clearly any such pronouncements would be deemed impolitic during a time in which the Soviets were seeking to dramatize

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[15]"Star Wars Will Ruin All Arms Control Negotiations," interview in *U.S. News and World Report*, September 30, 1985, p. 27. A similar line of argument was taken in a remark for American public consumption by Academician Roald Sagdeyev: "I think our military, our decisionmakers, came to the firm conclusion about the uselessness of such global defenses since long ago. I think the very fact of signing the ABM Treaty in 1972 is quite indicative of that." As for the heavy Soviet investment in homeland air defenses, Sagdeyev continued, that is "a different story. You know, it was a long tradition which came as a result of World War II, when our country was really devastated, at least during the first years of the war"—as though this rationale bore no connection to Moscow's involvement in BMD. Quoted in Elizabeth Pond, "Soviet Arms Control Initiative May Clarify Stance on Star Wars," *Christian Science Monitor*, June 3, 1986.

[16]In perhaps an unwitting reflection of the "left hand knoweth not" syndrome in Soviet politics, however, there appeared in 1977 a fascinating account of an obscure Soviet novel which romanticized the struggle for technical excellence, amidst all varieties of bureaucratic intrigue, in a fictional effort to develop and field the USSR's "first antimissile missile complex." This instructive morality tale lent persuasive support to the notion that whatever the agreed line on BMD may be in Soviet *external* discourse, the subject of ABM remains very much alive within internal Soviet military and defense-industrial circles. See the review by Engineer Colonel General (Ret.) N. M. Popov of the book *Bitva* ("The Battle") by Nikolai Gorbachev in *Knizhnoye obozreniye* (Moscow), No. 46, November 18, 1977, pp. 8–10.

[17]Michael Mihalka, "Soviet Strategic Deception, 1955–1981," *Journal of Strategic Studies*, March 1982, p. 56.

their commitment to the Treaty [18] Yet the record belies the claim of Arbatov and others that Moscow has been unenthusiastic from the start about its involvement in BMD.

For example, on the eve of the Cuban missile crisis, when the Soviet ABM effort was just beginning to produce its first returns, Foreign Minister Gromyko lamented the persistence of the nuclear "balance of terror" and favored a new regime featuring a mutual builddown of offensive forces, yet with an "exception" for a "limited and agreed-to number of . . . antimissile missiles and antiaircraft missiles" intended "to guard against the eventuality, about which Western leaders have expressed anxiety, of someone deciding to violate the treaty and conceal missiles or combat aircraft."[19] A more widely cited expression of this sentiment was voiced two years later by a prominent Soviet military theoretician, Major General Nikolai Talenskii, who wrote that "when the security of a state is based only on mutual deterrence by means of powerful nuclear missiles, it is directly dependent on the good will and designs of the other side, which is a highly uncertain premise." For that reason, Talenskii added, "it would hardly be in the interests of any peaceloving state to forgo the creation of its own effective means of defense against nuclear-missile aggression and make its security dependent only on deterrence, that is, on whether the other side will refrain from attacking."[20]

Lest one be tempted to dismiss Talenskii's remark as a narrow expression of military sentiment not shared by civilian contemporaries in the Soviet leadership, no less an authority than the late Premier Kosygin was moved to tell President Johnson at the Glassboro summit in 1967 that a ban on missile defenses was, in Henry Kissinger's words, "the most absurd proposition he had ever heard."[21] Kosygin voiced a

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[18]Interestingly, this drying up of the public literature did not entirely squelch internal Soviet military comment on BMD-related subjects. In a review of pertinent Soviet materials published since the conclusion of the ABM Treaty, the head of the Policy Planning Staff in the West German Defense Ministry recently determined that "although the Soviet literature refrained from any direct reference to the significance of missile defense, some writers showed that it was still possible to allude to the subject by extending the scope of air defense to space, as it were, and even by referring on occasion in this connection to the requirements of defense against 'ballistic' attack." Hans Ruhle, "Gorbachev's 'Star Wars,'" *NATO Review*, August 1985, p. 29.

[19]Speech to the U.N. General Assembly, September 26, 1962, excerpted in "When the Soviets Liked Superpower Defenses," *Wall Street Journal*, January 15, 1985.

[20]"Antimissile Systems and Disarmament," in John Erickson (ed.), *The Military-Technical Revolution* (Frederick A. Praeger, New York, 1966), pp. 225-227.

[21]Henry A. Kissinger, *White House Years* (Little, Brown and Company, Boston, Massachusetts, 1980), p. 208. According to another account of that meeting, Kosygin also said to Secretary of Defense McNamara: "When I have trouble sleeping nights, it's because of your offensive missiles, not your defensive missiles." Quoted in Fred Kaplan, *The Wizards of Armageddon* (Simon and Schuster, New York, 1983), p. 346.

similar outlook just before the commencement of SALT I when he observed at a London press conference: "I think that a defense system which prevents [missile] attack is not a cause of the arms race. . . . Perhaps an antimissile system is more expensive than an offensive system, but its purpose is not to kill people but to save human lives."[22] Taken out of context, that statement would strike most casual readers today as an exhortation by President Reagan on behalf of SDI.

All in all, as we shall see in the section to follow, the weight of evidence regarding Soviet involvement in antimissile research, development, and testing, to say nothing of Moscow's apparent willingness (at least until the advent of SDI) to press to the edges of permissibility with respect to ABM Treaty compliance, casts more than a trace of doubt on the idea propounded by some Western analysts that the Soviets underwent a "major change" in their thinking on the desirability of ballistic missile defense at about the time SALT began in the late 1960s.[23] Rather more persuasive, in our assessment at least, is the notion that the Soviets harbor no fixed view one way or the other regarding the value of strategic defense in the abstract, and that their shift in rhetoric in the aftermath of the ABM Treaty reflected far more a determination that it would not be to Moscow's advantage to engage in a BMD competition with the United States than any broader doctrinal conviction about the merits of mutual vulnerability as a basis for deterrence.[24] As the following discussion will bear out, the Soviet military continues to assign high priority to missile and space defense research, however hard-pressed its prevailing R&D and industrial base may be to support an all-out technological competition with the United States.

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[22]Quoted in Ernest Conine, "Soviets Ride a Crooked Mile in Space," *Los Angeles Times*, August 26, 1985.

[23]See, for example, David Holloway, "The Strategic Defense Initiative and the Soviet Union." *Daedalus*, Summer 1985, p. 259.

[24]This view is developed in David B. Rivkin, Jr., "What Does Moscow Think?" *Foreign Policy*, Summer 1985, pp. 93–95.

IV. SOVIET BMD PROGRAM TRENDS

Any uncertainties the Soviet defense establishment may have felt about its ability to cope with the U.S. bomber threat during the early and mid-1950s were probably exceeded many times over by doubts about the emerging—and far more demanding—missile and space defense challenge. Full-scale development of Soviet ABM and ASAT systems did not even begin until nearly a decade later. Nevertheless, the seeds of Soviet interest in dealing with the full range of defensive mission requirements associated with the new era of ballistic missiles were first planted during the early phase of Khrushchev's incumbency.

In a 1961 interview, Khrushchev recounted that "at the same time we told our scientists and engineers to develop intercontinental rockets, we told another group to work out means to combat such rockets."[1] Confirmation of this can be traced back to the initial tests of a first-generation Soviet ABM in 1957, the same year the Soviet Union launched its first ICBM. Component testing apparently continued through 1960 and finally progressed to a point where Marshal Malinovskii could announce at the 22nd Party Congress, in the first public disclosure of the Soviet ABM program, that "the problem of destroying missiles in flight . . . has been successfully solved."[2] Following Khrushchev's later extravagant claim that the Soviet Union had a missile that could "hit a fly in outer space,"[3] Kremlin commentary exuding confidence in the Soviet ABM began to appear with regularity. By 1964, the program had reached the point where the Soviets could actually put a reputed ABM, concealed in its canister, on public display during the October Revolution anniversary parade.

Beneath all this rhetoric and posturing, the realities of the Soviet ABM effort fell far short of the operational attributes the leadership had enthusiastically ascribed to it for what, in hindsight, can only be considered political and psychological gain. During those early years, the Soviet Union was still more engaged in a feasibility demonstration than in developing a deployable weapon that could accommodate the evolving U.S. ICBM threat. Site construction remained limited to the

[1]C. L. Sulzberger, "Excerpts from Transcript of Khrushchev Interview on Berlin and Other Issues," *New York Times*, September 8, 1961.

[2]*Pravda*, October 25, 1961. See also Theodore Shabad, "Russian Reports Solving Rocket Defense Problem," *New York Times*, October 24, 1961.

[3]Theodore Shabad, "Khrushchev Says Missile Can 'Hit a Fly' in Space," *New York Times*, July 17, 1962.

Moscow area. Moreover, although some Soviet spokesmen claimed that it was "theoretically and technically quite possible to counterbalance the absolute weapons of attack with equally absolute weapons of defense,"[4] others insisted that "the means of defense lag behind the means of attack" and that it remained "technically impossible" for ABM defenses to neutralize all incoming missiles.[5]

Regardless of the specific directions Soviet research and development strategy and internal technical debate may have taken, several factors probably combined during the early and mid-1960s to tone down both the scale of Soviet ABM development and the Kremlin's boasting about it. These included the ongoing U.S. ICBM program, not only in missiles but also in penetration aids; the almost certain internal controversy associated with the cost of the Soviet ABM effort; considerable turmoil in Soviet strategic doctrine; and the technical shortcomings of the Soviet ABM program itself.[6]

Nevertheless, a whole new mission area was opening up for the Soviet air defense establishment, which for bureaucratic and other reasons was quick to seize opportunities as it saw them. For example, special new sections of PVO were established in 1964 under the acronyms PRO ("antimissile defense") and PKO ("antispace defense").[7] Moreover, the Soviet leadership appeared disposed to underwrite these emerging mission areas with budgetary allocations at least adequate to develop a technology base upon which operational defenses might later be constructed.

In addition to its pioneering work in the ABM field, the Soviet Union was also showing interest in antisatellite weaponry, along with fascination over the long-term potential of lasers and directed energy. One commentator, for example, claimed that "powerful ground radar stations can produce plasma that will arise around a ballistic missile. . . . Under the effect of the energy produced by the plasma, the ballistic missile will either be destroyed or knocked off the flight trajectory."[8] Another pointed out that "if a method of focusing large amounts of energy over considerable distances is developed, it will be

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[4]Major General N. Talenskii, "Antimissile Systems and Disarmament," *International Affairs* (Moscow), No. 10, October 1964, p. 193.

[5]G. Gerasimov, "The First-Strike Theory," *International Affairs* (Moscow), No. 3, March 1965, p. 7.

[6]Ironically, this scaling back occurred just as a non-American ballistic threat to Moscow, one of the most commonly cited rationales for Soviet ABM activities in the last 15 years, was beginning to emerge in the British, French, and Chinese nuclear forces.

[7]"Soviet SDI—Reality Not Myth," *International Defense Review*, August 1985, p. 1219.

[8]Engineer Colonel M. Arkhipov, "Radiation Weapons," *Sovetskii patriot*, November 1, 1964, p. 3.

possible to resolve many scientific and technical questions, and especially the problem of destroying intercontinental missiles."[9] To some extent, this Soviet interest paralleled American research and development efforts, but there were unique aspects of the Soviet program as well.

Along with the accession of the Brezhnev-Kosygin regime to power in late 1964 came a major turning point in Soviet force development. The new leadership appeared determined to match long-standing Soviet military doctrinal prescriptions with a comprehensive array of weapons and other combat assets capable of backing them up. One goal of this effort was to provide the Soviet Union a credible nuclear war-survival posture through increased active and passive damage limitation capabilities. No major shift in mission tasking per se accompanied this redirection of investment emphasis. Yet the resultant military buildup and doctrinal reorientation relieved PVO of much of its former operational burden by placing primary responsibility for damage limitation on the counterforce capabilities of the Strategic Rocket Forces.

The post-Khrushchev buildup also sought to reaffirm the Soviet "all-arms" concept in the nuclear realm by putting on line a significant de facto "defensive" capability in the form of a capacity to draw down American offensive forces by means of a disarming attack. The comparative luxury of having to contend with what, at worst, might be a ragged and disorganized Western nuclear retaliation would naturally render the job of Soviet active defenses that much easier. In turn, the expansion of Soviet offensive forces gave PVO an extended lease on life and, for the first time, a serviceable mission: coping with independent nuclear deterrents and engaging the much smaller number of American bombers and missiles that might survive a preemptive Soviet attack.

Thus despite an emphasis on offensive damage limitation in Soviet force planning, PVO continued to receive ample attention and funding. In its first major military program decision, the Brezhnev regime in 1965 authorized full-scale ABM site construction around Moscow. By 1968, it could claim the world's first functioning ABM when the GALOSH system achieved initial operational capability.

Construction of the Moscow ABM halted not long afterwards, however, at about the time the first signs of Soviet interest in a serious

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[9]Engineer Lieutenant Colonel O. Andreyev, "Possible Military and Other Use of Lasers," *Voennye znaniye*, February 1965, p. 39.

arms limitation dialogue began to appear.[10] Although the motivations behind Moscow's expression of interest in arms control at that time remain a matter of contention in the West, the Soviets may have had serious doubts about the operational and technical prospects of GALOSH. They may also have seen the emerging U.S. layered area and terminal BMD system based on exoatmospheric and endoatmospheric interceptors as a threat to their impending fourth-generation ICBM deployments. Those two interceptors, Spartan and Sprint, were almost surely far superior to anything PVO might have managed to bring on line during the same period.

Whatever the case, the Soviets apparently opted to forgo further deployment of their existing ABM as a necessary price for heading off its substantially more sophisticated American counterpart—and perhaps also buying time to develop a more capable ballistic missile defense of their own.[11] Yet despite much debate on this question in the West, there is no evidence that the ABM Treaty confirmed any Soviet abandonment of the desirability of active homeland defense in principle. On the contrary, Soviet military writings since the Treaty have continued to highlight the enduring relevance of that function. Beyond that, every aspect of current PVO development speaks to an undiminished Soviet seriousness about the importance of active homeland defense, including ballistic missile defense, in Soviet military planning.

On this latter point, in a discussion of how the ABM Treaty affected subsequent Soviet BMD programs, a former senior CIA official, Sayre Stevens, remarked several years ago that "the level of activity at Sary Shagan continued much the same as before the Treaty was signed," revealing "a flavor of steady, unfrenzied progress toward defined development goals."[12] Similarly, a former Director of Defense Research and Engineering, Malcolm Currie, observed that in the aftermath of the ABM Treaty, American test activity in ABM interceptors went "practically to zero, just catastrophically within a couple of years," while comparable Soviet activity continued "monotonically

[10]See George Wilson, "Russians Slow Work on Antimissile Sites," *Washington Post*, August 11, 1968. In response to repeated American probings, Foreign Minister Gromyko announced in June 1968 that the USSR was now "ready for an exchange of opinion" on the matter of limiting strategic offensive and defensive arms. Report by Foreign Minister A. A. Gromyko, "On the International Situation and the Foreign Policy of the Soviet Union," *Pravda*, June 28, 1968.

[11]Construction of the Moscow ABM resumed in 1971 and ended with 64 deployed launchers in time for the conclusion of SALT I.

[12]Sayre Stevens, "The Soviet BMD Program," in Ashton B. Carter and David N. Schwartz (eds.), *Ballistic Missile Defense* (The Brookings Institution, Washington, D.C., 1984), p. 211.

steadily to go up." This indicated, he pointed out, a continuation of "intensive activity in ABM research and development from which [the Soviets] could react at some time in the future."[13]

In support of this point, the CIA has recently estimated that the USSR has spent the equivalent of some $150 billion on strategic defensive developments over the past decade, more than *15 times* what the United States allotted to comparable programs during the same period.[14] Few would argue that this investment has given the Soviets, at least so far, an operationally effective BMD capability—even against third-party nuclear forces, let alone the American ICBM and SLBM threat. Nevertheless, owing to the Kremlin's unilateral efforts in this area, according to former Secretary of Defense Harold Brown, "the lead enjoyed by the United States at the time we entered into the ABM Treaty has greatly diminished."[15] George Younger, the British Secretary of State for Defense, has nicely summed up the significance of these indicators: "The key point is that this is not a new Soviet program. It is not a response to the SDI. Far from it, it long predates it. It is not something peripheral to the Soviet effort in defense research. It is a key component of it."[16]

Today, the USSR maintains the world's only operational ABM.[17] This system consists of the ABM-1B, a modified GALOSH, deployed around Moscow in four complexes, each with 16 reloadable launchers.[18] It provides a single-layered defense of Moscow against a light ballistic missile attack. Battle management support is provided by the DOG HOUSE and CAT HOUSE target tracking radars south of Moscow and six TRY ADD guidance and engagement radars. The missile itself is housed in an above-ground canister and is equipped with a 3-MT

[13]Quoted in Sidney Graybeal and Daniel Goure, "Soviet Ballistic Missile Defense Objectives: Past, Present, and Future," in *U.S. Arms Control Objectives and the Implications for Ballistic Missile Defense*, Proceedings of a Symposium sponsored by the Center for Science and International Affairs, Harvard University, November 1–2, 1979 (Puritan Press, Cambridge, Massachusetts, 1980), p. 78.

[14]Warren Strobel, "Kremlin Has Spent $150 Billion on Its Own Star Wars, CIA Estimates," *Washington Times*, November 26, 1986. According to Secretary of Defense Weinberger, the Soviets have also spent as much on strategic defense since the signing of the ABM Treaty in 1972 as they have on their far more vaunted offensive programs. James J. Haggerty, "The Soviet SDI," *Aerospace*, Fall-Winter 1985, p. 2.

[15]Harold Brown, *Department of Defense Annual Report, Fiscal Year 1979* (Government Printing Office, Washington, D.C., 1978), p. 124.

[16]Younger in Great Britain, Parliament, *Parliamentary Debates*, House of Commons, Vol. 92, February 19, 1986, col. 337.

[17]The U.S. Mickelson ABM complex at Grand Forks, North Dakota, was ordered dismantled by Congress shortly after its completion on cost-reduction grounds.

[18]Reloads would be so slow, however, that the capability would probably not be helpful in combat.

warhead. It also incorporates some of the features of the SH-04 interceptor first reported in flight testing in 1976, including an ability to shut down and restart its motor during its ascent and thus "loiter" while target sorting.[19]

In recent years, 32 of the original 64 launchers were deactivated. However, the Moscow system has been steadily enhanced technologically since 1980. When completed later in the decade, it will offer a two-layered defense consisting of a total of 100 improved ABM-1 exoatmospheric interceptors and SH-11 GAZELLE endoatmospheric interceptors, both silo-based with an expected reload capability.

Supporting this system is an extensive warning network. The first echelon is made up of infrared missile launch-detection satellites that can provide up to 30 minutes' warning of an impending attack, as well as information on the attack's point of origin. The second layer consists of a line of overlapping over-the-horizon (OTH) radars directed toward U.S. Minuteman fields, which can also provide up to 30 minutes' warning. Backing up both systems and intended for attack characterization is a complex of HEN HOUSE phased-array radars situated at six locations around the periphery of the Soviet Union. These radars can cross-check OTH indications and provide information on the size of the incoming attack, as well as generate more precise target tracking and timing data. Technical improvements to enhance attack assessment are also in train.

Since 1983, the USSR has had under construction a large phased-array radar at Krasnoyarsk in Siberia. This radar fills gaps in the HEN HOUSE network by providing coverage of an arc from the Kola Peninsula to the Caucasus Mountains. It has been declared by the Reagan administration (and generally agreed even by the arms control community) to be in violation of the ABM Treaty, since it is not on the periphery of the Soviet Union and has the potential for providing terminal ABM battle management.[20] The entire network, including a new large engagement radar at Pushkino, is expected to be completed by the late 1980s.

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[19]The information on Soviet ABM and antisatellite trends discussed in this section is drawn from the Defense Department's annual publication, *Soviet Military Power* (Government Printing Office, Washington, D.C., 1984 and 1987). For additional data, see also *Soviet Strategic Force Developments*, testimony before a joint session of the Subcommittee on Strategic and Theater Nuclear Forces of the Senate Armed Services Committee and the Defense Subcommittee of the Senate Committee on Appropriations, June 26, 1985, by Robert M. Gates, Deputy Director for Intelligence, Central Intelligence Agency, and Lawrence K. Gershwin, National Intelligence Officer for Strategic Programs, *Central Intelligence Agency; and Soviet Strategic Defense Programs* (Department of Defense, Washington, D.C., October 1985).

[20]For the fullest available documentation, see "The President's Unclassified Report to the Congress on Soviet Noncompliance with Arms Control Agreements" (Office of the Press Secretary, The White House, Washington, D.C., February 1, 1985).

This continuing Soviet development of long lead-time items like warning and battle management radars, not to mention ambiguities in the testing of SA-10 and SA-X-12 surface-to-air missiles that suggest possible ABM applications, reflects a disconcerting process of what has been called "creep-out" along the margins of the ABM Treaty. These trends may be contributing to a real Soviet breakout option by the middle of the next decade should the Kremlin, for any reason, find merit in reneging on the ABM Treaty. Indeed, one possible reason for Moscow's unhappiness over SDI is that it will render more difficult any such Soviet breakout option by placing the United States in a position in which it could be a potentially unbeatable competitor.[21]

Whatever the case, the continued pursuit of such "creep-out" measures (for instance, advancing the longer lead-time items to a point where they might be rapidly made operational and continuing to press at the margins of legality on surface-to-air missile (SAM) upgrades) could, at some point, give the Soviets a deployable system with a not-inconsiderable ABM capability that could be brought on line in months rather than years. In an early intimation of possible Soviet thinking along these lines two decades ago, Lieutenant Colonel V. Bondarenko expressed an argument for "creating a basically new weapon, secretly nurtured in scientific offices and design collectives," which, he said, could "abruptly change the correlation of forces . . . and deprive the adversary for a long time of any possibility of applying effective countermeasures against the new system."[22]

Because of their miniscule potential for engaging high-speed reentry vehicles, the SA-10 and SA-X-12 almost surely do not portend any threat to U.S. ICBMs. They could, however, be developed to a point where they might be able to intercept U.S. and third-country SLBM warheads and short-range attack missiles (SRAM), which are slower and present larger radar signatures.[23] They, or developments based on them, might also have eventual applications against U.S. theater ballistic missiles such as Pershing II.[24]

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[21]For a good, if now dated, analysis of possible Soviet calculations with regard to the gains and risks of abandoning the ABM Treaty, see Abraham S. Becker, *Strategic Breakout as a Soviet Policy Option*, The RAND Corporation, R-2097-ACDA, March 1977.

[22]"Military-Technological Superiority: The Most Important Factor in the Reliable Defense of the Country," *Kommunist vooruzhenykh sil*, No. 17, September 1966, pp. 7–14.

[23]David S. Yost, "Soviet Ballistic Missile Defense and NATO," *Orbis*, Summer 1985, p. 284.

[24]Indeed, the SA-X-12 has reportedly been tested against the Soviet SS-4 medium-range ballistic missile (MRBM) and SS-12 short-range ballistic missile (SRBM) (see "New Soviet Missile Defenses," *Foreign Report*, April 14, 1983, and Michael Gordon, "CIA Is Skeptical That New Soviet Radar Is Part of an ABM Defense System," *National Journal*, March 9, 1985, p. 524). This, one might add, despite Soviet claims as to how it

As for exotic technologies, there is less to be said because the public evidence of Soviet R&D activity is far more elusive. It is commonly known, however, that the Soviets have long been engaged in a serious program of particle-beam research. They are also working on lasers and other forms of directed energy that could likewise be aimed toward a first-generation BMD capability, although probably not until well after the end of this century.

Soviet laser research goes back at least to the early 1960s, when Khrushchev was said to keep a slab of laser-riddled steel prominently displayed on his desk as a testament to Soviet technological prowess. Today, the USSR maintains six R&D facilities and test ranges employing over 10,000 scientists and engineers dedicated exclusively to laser research. According to published U.S. government reports, these enterprises are engaged in work on a variety of gas dynamic, electric discharge, and chemical laser concepts, all with potential defensive weapons applications. By these same accounts, the Soviets are said to have already deployed a first-generation ground-based laser at the Sary Shagan BMD test center capable of interfering with American satellites in low orbit. They also have allegedly tested both ground and airborne lasers intended for point defense of ships and for theater and homeland air defense roles. According to one press report, they now have under construction a facility at Dushanbe, near the Soviet-Afghan border, intended to house the world's first ground-based operational ASAT laser.[25]

Alongside their laser development efforts, the Soviets have also reportedly invested in several kinetic-energy concepts with potential BMD roles. For example, they are said to be working on electromagnetic propulsion devices, including a rail gun, and they have tested another gun capable of shooting streams of heavy metal particles such as tungsten at speeds approaching 60 km/sec in a vacuum. As in the case of Moscow's laser, radio frequency, and particle-beam research, these efforts appear to be striving not just to validate scientific theories, but to develop technologies that could eventually lead to deployable weapons.[26]

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should be "clear to every unbiased person that the Soviet Union's air defense system bears no relation to ABM defense." "On the United States' So-Called Strategic Defense Initiative," *Izvestiia*, January 25, 1985.

[25]"Photos Show Soviets Embarked on Star Wars Preparations," *San Diego Union*, October 26, 1986.

[26]The most comprehensive U.S. government statement on Soviet exotic weapons research is offered in "SDI: The Soviet Program" (Bureau of Public Affairs, U.S. Department of State, Washington, D.C., Current Policy No. 717), which reprints an address by Paul Nitze to the Chautauqua, New York, Conference on Soviet-American Relations, June 28, 1985. See also "USSR: Nitze on Soviet Strategic Defense," *Defense*

Finally, in the realm of antisatellite warfare, where Soviet statements would have Western audiences believe the USSR is not involved at all, the Soviet Union has had a first-generation capability to intercept and destroy satellites in low orbit since the 1970s.[27] This capability features a rocket-launched weapon designed to rendezvous with its target using onboard radar sensors and then destroy it with a pellet warhead. It has been described by one press account as "the space equivalent of a Beirut car bomb."[28] This system, currently the world's only operational ASAT, is deployed on two launch sites at the Tyuratam missile test center. With reloads on hand, it could loft several interceptors a day. In comparison to the U.S. ASAT technology demonstrator based on a SRAM booster that has been successfully flight-tested from an airborne F-15, the Soviet system is not very sophisticated. But it remains a visible manifestation of Soviet intent and clearly belies Soviet propaganda. The Soviets also have the technical capacity for employing electronic and countersensor measures against U.S. satellites.

This brief overview has not sought to provide a complete account of the Soviet BMD effort or its historical predicates. Rather, our goal has been to develop several themes of immediate relevance to this report. Three points, in particular, are worth special mention. First, Moscow's stress on (and doctrinal support for) homeland defense has transcended various comings and goings in Soviet strategy as a whole. There has long been a fundamental inseparability, in both concepts and practice, between offense and defense in Soviet military planning and force employment policy. Second, the Soviet propaganda campaign against SDI patently glosses over, to the point of outright misrepresentation, long-standing and tangible Soviet programmatic activity in the BMD field. Third, Soviet strategic defensive thinking and R&D have not

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and Foreign Affairs Daily, July 5, 1985; and Jack Anderson and Dale Van Atta, "Soviets Take Lead in Space Lasers," *Washington Post*, September 6, 1985.

[27]Understandably, the Soviets have been reluctant to admit any involvement of their own in the missile and space defense business. For example, in May 1985 former Defense Minister Sokolov denied that the USSR was engaged in developing what the Soviets call "space strike weaponry," although he conceded that Moscow was indeed working on passive space systems for C3I and early warning (see Eaton, op. cit.). However, apparently responding to widespread Western awareness that Moscow is less than untainted itself with regard to space weapons development, Colonel General Chervov, the General Staff's spokesman on arms control, conceded for the first time in an interview shortly thereafter that the Soviet Union had successfully tested an ASAT weapon, even though he insisted that the system in question consisted of land-based missiles rather than "killer satellites," as if the intent were any different. See Pierre Simonitch, "USSR Has Antisatellite System," *Frankfurter Rundschau*, May 30, 1985, and "USSR: Soviet General Confirms ASAT System," *Defense and Foreign Affairs Daily*, June 11, 1985.

[28]"Star Wars: The Soviet Thrust," *U.S. News and World Report*, February 18, 1985, p. 34.

been concerned with "preserving options" or otherwise hedging against potential American breakthroughs. On the contrary, the Soviet effort has been broad-ranging, aggressive, and enduring, with an ultimate view toward striving for significant damage-limiting capabilities. Nothing about SDI, therefore, should be in the least bit unfamiliar to anyone in the Soviet political or military establishment in an appropriate position to have formal cognizance of these activities.

V. POSSIBLE UNDERLYING SOVIET CONCERNS ABOUT SDI

As noted above, a prominent strain of disingenuousness has pervaded Moscow's pronouncements against SDI. This heated rhetoric has contrasted sharply with the Kremlin's studied silence with respect to its own activity in the home defense sphere. It hardly follows, however, that the Soviets view SDI with equanimity.

To be sure, many of their stated criticisms of SDI mask their underlying concerns. For example, their intimation that any American deployment of space-based missile defenses will make nuclear war "inevitable" is exaggerated, if only because of the Soviet Union's inherent predisposition toward caution and risk avoidance.[1] Likewise, their claim that SDI will "wreck arms control" has merit only if they continue to participate in allowing it to do so through their own unwillingness to countenance significant mutual offensive force reductions in the face of a continuing SDI of some sort, as appeared to be their going-in position at Reykjavik. And it is unlikely that the Soviets are nearly so persuaded in private of their public line that SDI represents the bow wave of an American first-strike or "war winning" capability. Whatever propaganda returns they may have accrued from this allegation, they must appreciate that even were that President Reagan's ultimate goal, Congress and the American public, to say nothing of our NATO allies, would be ill-disposed to support such a provocative strategy.

Indeed, there are good reasons for believing that Moscow's apprehensions over SDI as a *military* threat are distinctly subordinate to more proximate and pressing concerns of a political and economic nature. Of course, the most troubling *long-term* ramifications of SDI are military and strategic. Yet barring a truly miraculous development, such as the leak-proof "astrodome" originally alluded to by President Reagan in his March 1983 address, the ultimate ability of the Soviet Union to retaliate against the American urban-industrial base will not be eliminated by SDI. Even should such a serious erosion of this now-established foundation of deterrence eventually occur, it will probably not happen for at least several decades.

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[1]For more on this, see Benjamin S. Lambeth, "Uncertainties for the Soviet War Planner," *International Security*, Winter 1982-83, pp. 139-166.

Such an outlook has been strongly hinted at in the specialized Soviet military press, which is written for precisely those Soviet readers one would think would be most professionally concerned about SDI. In contrast to the near-orgy of SDI-bashing that has come to dominate the more popular Soviet media, this literature has shown remarkable composure with respect to the near-term threat posed by SDI. For example, in a series of six long articles on military space developments that appeared in the Soviet Air Force's monthly magazine since the onset of the Soviet campaign against SDI, the program was treated in straightforward language almost entirely devoid of propaganda fulmination.[2] Significantly, the pejorative term "space strike weapons," so commonly used in the general press to characterize SDI as a "first-strike" threat, was not invoked even once. On the contrary, the tone of the series was uniformly calm. Its principal thrust was to emphasize the considerable difficulties lying in the path of perfecting SDI-associated technologies, with the clear implication that the program was likely to become a serious military threat to the USSR only in the longer run.

In this same vein, an article dealing with laser and directed energy weapons noted that "the present level of science and technology . . . still cannot offer concrete paths and methods for resolving tasks connected with the creation of space-based beam weapons. Today, it is considered a matter for the very distant future."[3] Even more unruffled was the monthly PVO periodical, which in all of 1984 and 1985 contained but one article addressing SDI, likewise a straightforward and nonalarmist account of the various technologies currently being considered within the SDI context.[4]

The real implications of SDI for Soviet operational planning thus boil down to the various fine points regarding force employment that the Soviet High Command has sought to graft onto its larger body of strategy as the latter has evolved over the years. These concerns do *not* include whether the United States threatens to attain some profound military advantage. Rather, they more likely relate to such issues as the changing relationship between nuclear and nonnuclear forces, the role of nonstrategic nuclear weapons (and strategic

[2]The series was titled "The Orbital Arsenal of the Pentagon" and appeared in *Aviatsiia i kosmonavtika*, Nos. 8, 9, and 10, 1984, and Nos. 6 and 8, 1985. For further discussion and analysis, see *Problems in Assessing the Soviet Union's Response to SDI: Military Press Coverage*, Radio Liberty Research, September 4, 1985.

[3]"The Space Weapon," *Aviatsiia i kosmonavtika*, No. 8, 1984, p. 11.

[4]M. Shekelov and V. Nikolayev, "The Militarization of Space," *Vestnik protivovozdushnoi oborony*, No. 7, July 1984, pp. 88–90. This one article contrasted with a dozen or so pieces on American cruise missiles and tactical airpower that appeared during the same period.

nonnuclear weapons), and similar matters involving relative force effectiveness at the margins. The advent of SDI at this juncture in history almost has to be regarded by the General Staff as less significant, in terms of its ultimate repercussions and threat potential, than might have been the case two decades ago, when a struggle for some measure of strategic superiority was still under way (or, more correctly, when the outcome of such a struggle mattered more). Today, both superpowers have acquired balanced, diversified, and highly capable nuclear arsenals. Truly meaningful change in the resultant equilibrium comes both in smaller increments and at increasingly longer intervals. This has not, of course, eliminated Moscow's requirement to think through the many operational and tactical issues presented by SDI. On the contrary, the number of ways in which SDI could potentially unfold is quite large, and many troubling possibilities doubtless exist in the Soviet Union's playbook of contingencies. But the *immediate* military significance of SDI is not so great.

Soviet planners thus most likely view SDI in the final accounting as a military problem, but not an especially prepossessing one in the near term. Indeed, as SDI develops, it may turn out that what occurs "off plan" could prove more important militarily than what occurs according to schedule. In all events, the odds of an American SDI breakthrough that could be combined in short order with the numerous other capabilities that would be needed to reverse the overall military balance are quite low. The odds that it could, at the same time, shift the net *strategic* balance are even lower.

Far more palpable on Moscow's list of SDI-related worries is, in all likelihood, the economic aspect. In effect, what President Reagan proposed in announcing SDI was that the United States shift a major part of the arms competition away from areas in which the USSR held clear advantages toward one of the few areas in which the United States might bring its greatest strengths to bear in a competitive way. By forcing the Soviets to play a game in which they are least qualified, strapping them for resources and undercutting whatever plans they might have had for exploiting their technological strides in the civilian economy, the relative cost-benefit ratio of such a competition could be highly favorable to the West. Were the Soviets determined to press ahead in such a game nevertheless, they might be forced to suffer additional resource diversions, abandon other pursuits in which they were seeking goals inimical to the West, and perhaps settle for arms control arrangements to the net benefit of the United States.

As in the case of the military-technological implications of SDI, however, even these considerations are likely only to make their influence felt on the Soviet Union over the longer haul. For the nearer

term, the resources and technologies at issue have not appeared to be beyond the means of either side. It is an extended, multiyear (and probably multidecade) competition that would more likely begin to confront the Soviets with the economic crunches that SDI and its offshoots can potentially impose upon them. Accordingly, although such forebodings have undoubtedly captured the attention and concern of Soviet planners, they are probably not yet viewed by the leadership as warranting any immediate radical diversion of current investment priorities.

By far the most likely near-term source of Soviet agitation over SDI has to do with high-level concerns that the program may undermine existing worldwide perceptions of Soviet military prowess if allowed to mature, irrespective of any technical problems it may encounter along the way. Put differently, Moscow's abhorrence of SDI—as manifested in its unprecedented campaign to kill the program *à outrance*—is not mainly a reflection of SDI's expected military or economic impact so much as a recognition of its dangerous *political* implications. In this regard, it is vital to bear in mind that military power is the *sine qua non* of the Soviet state. It is also military power that has singularly bestowed upon the USSR its claim to "essential equivalence" with the United States. The Soviets have invested a great deal in their strategic nuclear posture over the past two decades. Indeed, in some respects that posture is more important to their sense of place on the global stage than their entire network of assorted allies and clients around the world. Insofar as SDI aims, in President Reagan's words, to render nuclear weapons "impotent and obsolete," it threatens—at least from the Kremlin's vantage point—to render worthless the very foundation of the USSR's superpower status.

In light of the numerous other force modernization efforts, both nuclear and conventional, that have been actively pursued by the Reagan administration, SDI is probably viewed by the Soviets, first and foremost, as yet another indication that the United States has become a determined adversary again after years of comparatively slack involvement in the arms competition.[5] After all, Moscow had ample

[5]In fairness to the record, the extent to which the United States failed to hold up its end of the strategic balance during the so-called "decade of detente" remains a matter of heated contention among American defense professionals. For two strongly contrapuntal views on this issue, see Colin S. Gray and Jeffrey G. Barlow, "Inexcusable Restraint: The Decline of American Military Power in the 1970s," and Robert W. Komer, "What 'Decade of Neglect?'" both in *International Security*, Fall 1985, pp. 27–69 and 70–83, respectively. Whatever the merits of the various arguments regarding the adequacy of defense undertakings by the Nixon-Ford and Carter administrations, however, most analysts accept that by the standard measure of percentage of GNP spent on defense, the Reagan buildup has been the largest sustained military force expansion in American postwar history.

reason to be pleased with the strategic stature it acquired as a result of SALT I. Soviet spokesmen freely admit that the United States maintained strategic superiority until about 1970, when the USSR first surpassed the United States in total numbers of ICBMs and SLBMs. Subsequently, Moscow's ability to exploit the formidable throwweight advantage of its ICBM force with MIRV afforded the Soviet Union, for the first time, a true countervailing (or overcoming) tool to offset the traditionally more capable American strategic arsenal. In view of that hard-won achievement, it must inspire considerable consternation for the Soviets to contemplate the possibility that the tables may be about to be turned on them again as a result of SDI.

Indeed, since SDI was announced, Soviet commentators have frequently denounced it as bitter proof of America's unwillingness to reconcile itself to living with an equally endowed adversary. Yet a good deal of genuine discomfiture must underlie this lament. When Soviet officials complain that SDI has eroded the SALT "consensus" (which, one might add, has worked to Moscow's pronounced advantage over the past decade and a half), what they probably fear—and with good cause—is that the rules of the game have changed and that their own ambitions will henceforth be harder to come by because of Washington's new-found determination to counter or preempt them.[6]

Related to this assessment may be a Soviet belief that SDI is part of a larger effort on the part of the United States to broaden its strategic options in case of war—or at least to undermine Moscow's *own* force enhancement and war survival efforts. During the 1970s, planned American strategic modernization initiatives often quite literally did not get off the ground. The B-1A was cancelled outright by President Carter in 1977, and both MX and Trident modernization schedules slipped dramatically. Yet later came a new doctrinal debate leading to the promulgation in 1980 of PD 59 on nuclear employment policy, along with such parallel developments as MX, Trident D5, and Pershing II, as well as B-1B and the Advanced Technology Bomber (ATB). Against the backdrop of these events, Moscow may be inclined in its darker moments to consider SDI as a possible stepping stone toward a significant U.S. strategic advantage. This, in such a Soviet view, might contribute to American resolve in crises, promote a more assertive U.S. international posture, and perhaps even encourage Washington to preempt in a sufficiently grave military showdown.

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[6]This is implied in the Soviet observation that SDI represents not just a new development in U.S. hardware, but also a change in the American theory of deterrence. See, for example, V. R. Bogdanov and A. I. Podberezkin, "Notes on the Qualitative Arms Race," *SShA: ekonomika, politiku, ideologiia*, No. 3, March 1984, pp. 120–127.

In this regard, the Soviets have repeatedly argued that ballistic missile defense (or at least a hypothetical American one) favors the attacker, since it would be easier to blunt a ragged retaliatory strike by the enemy's surviving nuclear forces than it would be to deflect the full brunt of a ballistic missile attack. Of course, this refrain has generally been expressed by the Soviets in a propaganda context. But that scarcely vitiates its substantive merit. The Soviets are probably not nearly so fearful of an increased danger of war emanating from SDI as their more outspoken statements would have us believe. Furthermore, as noted above, they almost surely appreciate that any *serious* effort by the U.S. government to seek a first-strike capability would face, at the very least, formidable domestic and intra-NATO political obstacles. It is entirely plausible, however, that they view SDI as a major threat to their *own* concept of deterrence by denial.

Even a less than leakproof American BMD would undermine Moscow's considerable investment in hard-target ICBM development over the past two decades. Were a deployed SDI system incapable of negating the entire Soviet ICBM threat to the United States, Soviet decisionmakers would still have good reason to worry about possible interactions between offensive and defensive forces flowing from the potential capacity of American defenses to handle those Soviet forces that survived a preemptive attack. Such a concern has been strongly implied by Gorbachev himself. Although the Soviet leader dismissed as "sheer fantasy" the proposition that SDI can assure the United States absolute invulnerability from Soviet nuclear retaliation, he nevertheless conceded that "even on a much more modest scale, in which the Strategic Defense Initiative can be implemented as an antimissile system of limited capabilities, the SDI is very dangerous."[7]

A potential, if highly improbable, American counterforce bolt from the blue could be a matter of even greater Soviet concern, assuming a reasonable ability on the part of SDI to cope with Soviet retaliatory forces. Some specific examples of this possible Soviet concern are worth noting. First, U.S. countersensor attacks will become a graver Soviet worry if and when SDI is deployed, since the Kremlin will lose its ability to preempt on reliable warning and will also be deprived of a space tracking capability. This anxiety could be further amplified if certain SDI components were able to function in a dual BMD and counter-ASAT/sensor role. Second, American threats of selective nuclear use in support of theater war aims would be more credible were there a concomitant ability to deal with Soviet limited nuclear

[7]Gorbachev interview in *Time*, September 9, 1985, p. 24. This would depend, of course, on a Soviet willingness to concede the United States the first shot, something that cuts against the grain of everything we know about Soviet operational doctrine.

employment.[8] Third, given the nature of many potential space-based BMD systems, the incentives for preemption (by either side) in a deep crisis could grow—contingent, of course, on leadership risk-taking propensities. More than in any other military competition, the cheapest way of protecting space-based components against the effects of direct attack would be by decisive offensive action at the outset of hostilities.

There would, of course, be some novel features to any SDI-related threat of this sort. In the main, however, the Soviets would find themselves on distressingly familiar ground. During the early 1960s, it bears recalling, a U.S. first strike could have decimated Soviet nuclear forces, except perhaps for those peripheral weapons targeted against Western Europe and the Far East. What intercontinental attack forces might have survived, moreover, would have had to run a gauntlet of American air defenses including, among other things, some 2000 interceptors and several thousand SAM and antiaircraft artillery (AAA) installations. In effect, the United States had a credible first-strike capability that could have disarmed the Soviets at comparatively low cost.

That epoch, along with the triumph in the Cuban missile crisis it afforded the United States, remains a bitter Soviet memory. It had much to do with precipitating the Soviet buildup that began after Khrushchev's ouster in 1964. It also entailed an imbalance of *military* forces, whatever one might have said about the prevailing *perception* of the balance, that Soviet planners must be anything but anxious to relive. For this reason alone, any determined SDI deployment will put great pressure on the Soviets to undertake programmatic responses at least sufficient to restore an acceptable *image* of parity. The Soviets could feel doubly menaced were SDI unaccompanied by any appreciable limitations on U.S. offensive potential, were the United States to rely increasingly on nuclear options in support of theater deterrence, or if the BMD in question did not achieve a very high level of operational performance.

This last point is especially important, since a "halfway" American SDI posture could have uniquely troublesome implications for Soviet planners. A partial defense, namely, one unable to defend the United States against a full Soviet first strike, might nevertheless have considerable utility in Soviet eyes in conjunction with the first shot. Were the price of admission through such a halfway defense sufficiently prohibitive, the Soviets could not afford to launch less than all-out

[8]This would, however, hold true only were the Soviets *not* to deploy an analogous BMD system. Were the latter to occur, the United States would be forced to increase its raid size to assure saturation of the enemy's defenses, with all the escalation and crisis-destabilizing results such a move would imply. We are indebted to George Donohue for calling this point to our attention.

attacks. For that reason, even a partial American BMD capability could confront the Kremlin with added security dilemmas.[9]

Significant American SDI progress could also have discomfiting implications for other aspects of the military competition from a Soviet planner's perspective, including the competition in nonnuclear forces. The most obvious case in point, and one least likely to be overlooked by the Soviets, would concern analogous theater defense functions. Although some SDI components might not be particularly appropriate in a theater setting (such as certain space-based defenses, given the shorter flight time and lower apogee of tactical reentry vehicles), others could prove notably helpful in relieving current and emerging Western vulnerabilities.

Any such Soviet concern has probably already been kindled by ongoing Western efforts to hedge against the growing Soviet theater ballistic missile threat, both nuclear and conventional, to such critical NATO assets as air bases, nuclear weapons storage bunkers, command and control sites, and so on.[10] The same applies with respect to protecting Western maritime assets against cruise missiles and other weapons launched from standoff aircraft. And a follow-on Soviet ballistic threat to naval targets along the lines of the abortive SS-NX-13 cannot be ruled out, given emergent Soviet predilections in favor of the offensive in naval warfare.

Other technological spinoffs from SDI could be of nearly equal concern to the Soviets. The development of high-speed data handling capabilities essential for effective battle management against large ballistic missile raids, for example, might have applications in other areas as well, such as air defense. The same applies in the case of certain sensor technologies, such as those that might be exploited to detect, track, and direct conventional munitions to deep theater targets, such as mobile armored concentrations. In light of these and other possible applications, the Soviets should have ample ground to be nervous over the long-term operational implications of *any* technology base that might develop as a result of SDI, whatever eventually happens to SDI itself. In this regard, Academician Velikhov has expressed "serious apprehensions" over the prospect of American developments in computers, delivery accuracy, and miniaturization that might

[9]Of course, a halfway *Soviet* BMD capability would have a comparable effect on our own selective employment options. For amplification, see Kevin N. Lewis, "BMD and U.S. Limited Nuclear Employment Policy," *Journal of Strategic Studies*, June 1985, pp. 125–144.

[10]For a good discussion of the emerging Soviet tactical ballistic missile threat and its operational implications, see Dennis M. Gormley, "A New Dimension to Soviet Theater Strategy," *Orbis*, Fall 1985, pp. 537–569.

eventually go so far as to help enable the United States to "make a conventional, nonnuclear first strike against the strategic weapons systems of the Soviet Union."[11]

Measures to offset these developments could prove especially challenging should the Soviets eventually find themselves forced to deal with boost-phase intercept capabilities, in which case simply MIRVing up or adding penetration aids to their ICBMs will not help much. These measures will necessarily entail substantial programmatic burdens that Soviet planners, military and civilian alike, might genuinely prefer to avoid. They could also aggravate an already overtaxed Soviet economy, as we will discuss more fully below, and could prove disruptive to Soviet efforts to invest in other sectors, both within and outside the defense realm.[12]

Finally, SDI is probably viewed by Moscow as the cutting edge of a serious threat to convert areas of American technological leadership into a practical advantage. Whatever disdain the Soviets may harbor for the United States from an ideological viewpoint, there is no denying that they hold American technological prowess in high regard. Although they have long been busily at work on their own BMD program, that effort had gone largely uncontested until the advent of SDI. A sustained American effort to validate new BMD concepts would mean that those comparable Soviet activities would now have to shoot at a fast-moving technological target. It could also threaten to leave Moscow in a pronounced second place in the technological competition.

Since President Reagan first articulated his SDI vision, the Soviets have repeatedly boasted *en passant* that they can match it easily should the need arise. For example, the director of the Soviet Union's largest center for laser and fusion research, Nobel prize-winning physicist Nikolai Basov, asserted in 1985 that the USSR would have "no scientific problem in developing lasers capable of intercepting missiles in space."[13] These too-casual-by-half asides have had a tone of nervous whistling past the graveyard and may reflect some abiding private fears that in fact the Soviets *cannot* so easily (or affordably) counter SDI.

On balance, Moscow has reaped great propaganda benefits from those American scientists who have insisted that SDI will never work.

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[11]Interview with Christoph Bertram and Christian Schmidt-Hauer, *Die Zeit*, November 21, 1986, p. 5.

[12]The Chief of the Soviet General Staff, Marshal Akhromeyev, admitted in a Czech newspaper article in 1983 that the Soviet Union was only beginning at that time to emerge from "a serious economic slump." "We Must Not Allow War: The Doctrine of Aggression and the Doctrine of the Defense of Peace," *Pravda* (Bratislava), June 22, 1983.

[13]Remarks at Madrid's Polytechnical University, as reported by *Agence France-Presse*, January 28, 1985.

Yet the remarkable outpouring of Soviet effort to subvert the program politically constitutes strong evidence of a deep Soviet concern that it will work only too well—or well enough to compel heavy Soviet spending in an anxious atmosphere. A revealing glimpse into the Kremlin's innermost worries may have been provided in this statement by General Sergei Lebedev, a Soviet General Staff spokesman, in response to a claim by the head of SDIO that "remarkable progress" had recently been made in SDI's technology validation efforts: "We have to believe him, in order to be on the safe side. . . . Even if SDI doesn't look feasible now, we are afraid it will reach the stage where it cannot be stopped."[14]

[14]Cited in Flora Lewis, "Soviet SDI Fears," *New York Times*, March 6, 1976.

VI. POTENTIAL RESPONSES NOTED IN OPEN SOVIET COMMENTARY

Predictably, Moscow's reactions to SDI have included a prominent warning that any American BMD deployment (or even development beyond a certain point) will meet with determined Soviet countermeasures. By and large, admonitions of this sort have remained limited to general assurances that the Kremlin will respond "as necessary" to prevent the United States from recapturing strategic superiority. Yet beyond such generic warnings, there have occasionally been more focused Soviet statements suggesting that such responses could come in the form of offensive systems, defensive systems, or both—including programs aimed at directly suppressing SDI. Many of these statements have merely repeated arguments put forward by Western critics of SDI. Nevertheless, they have been comprehensive enough to embrace most of the response options that would be available to the Soviets, at least in the near term.

At the most general level, Moscow's position was initially voiced by Party leader Andropov himself in his reply to President Reagan's SDI announcement, when the General Secretary affirmed that the Soviet Union "will never be caught defenseless by any threat."[1] This point was echoed shortly thereafter by Defense Minister Ustinov, who insisted that the USSR could be counted on not to "forgo its security interests or the security of its allies."[2] In the ensuing shuffle that followed Andropov's death, Party bosses Chernenko and later Gorbachev were also heard from in much the same vein. In a typical refrain, Chernenko noted in May 1984 that any American SDI effort would naturally oblige the Soviet Union "to take measures to guarantee its security reliably."[3] Reiterating this message shortly before he died, Chernenko pointed out that "if we are compelled, we shall do our utmost, as we have done more than once in the past, to protect our security and the security of our allies and friends."[4] More recently yet, the Chief of the General Staff, Marshal Akhromeyev, cited Gorbachev's address to the April 1985 Communist Party plenum, in which the latter avowed that "we will continue to spare no effort to ensure that the

[1]Interview in *Pravda*, March 27, 1983.

[2]Speech in East Germany, in *Krasnaia zvezda*, April 7, 1983.

[3]Reply to an appeal by U.S. scientists, *Pravda*, May 20, 1984.

[4]Interview with Cable News Network, *Pravda*, February 2, 1985.

USSR armed forces have everything necessary for the reliable defense of our fatherland and its allies so that nobody can take us by surprise."[5]

Soviet spokesmen have also gone out of their way to insist that the USSR is amply endowed with the assets needed to make good on this admonition. For example, Academician Velikhov observed in *Pravda* that "the Soviet Union has repeatedly proved that its existing economic, scientific, and technical potential enables it to respond adequately and in the briefest possible time to any threat against its security."[6] Likewise, then-Foreign Minister Gromyko assured a domestic television audience in January 1985 that any American effort to regain strategic superiority through SDI would end in failure: "We will not allow that. We have colossal resources, both material and intellectual, sufficient to enable us to secure our position."[7]

Comparable statements from other Soviet spokesmen since President Reagan's 1983 speech could be marshalled at length. The gist of the Soviet line, however, was summed up in the following injunction by *Pravda* that in its seeming fixation with the technical aspects of SDI, the United States was forgetting "the main thing—the Soviet Union's inevitable reaction . . . . The Soviet Union will not sit idly by."[8] Whatever form such an "inevitable reaction" might take, *Pravda*'s editor drove home the essence of Moscow's message with a warning that "every poison has its antidote. We will find the means of countering space weapons."[9]

So much for the apparent determination of would-be Soviet SDI counterplanners. As for precise "antidotes," the Kremlin's statements

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[5]"The Great Victory and Its Lessons," *Izvestiia*, May 7, 1985. Moscow's determination to maintain its position of "equal security" in the face of SDI was also stressed by Marshal Akhromeyev, who pointed out that "the USSR will not allow the United States to achieve strategic superiority over it. No one should have any doubts on this question." Marshal S. Akhromeyev, "The Superiority of Soviet Military Science and Military Art as One of the Most Important Factors of Victory in the Great Patriotic War," *Kommunist*, No. 3, February 1985, pp. 49–63.

[6]Velikhov, *Pravda*, April 30, 1984. Essentially the same message was expressed in Ye. Velikhov and A. Kokoshin, "Nuclear Weapons and the Dilemma of International Security," *Mirovaia ekonomika i mezhdunarodnye otnosheniia*, No. 7, April 1985, pp. 33–43.

[7]Conversation with Soviet journalists, Moscow television, January 13, 1985.

[8]*Pravda*, March 22, 1984.

[9]Viktor Afanasyev, "The Lessons of the Great War," *Le Monde*, May 16, 1985, p. 2. Some Soviet commentators have voiced a preference not to compete with the United States in strategic defenses, but then proceeded to note that U.S. determination to press ahead with SDI leaves the USSR no choice—even in light of the asserted "futility" of missile defense. Academician Velikhov put it this way: "It would be good if we don't try to respond . . . . It's irrational from a military point of view, irrational from [illegible] economic point of view. But it's very difficult to resist if the U.S. spends half a trillion dollars for this crazy development." Interview in *Los Angeles Times*, July 24, 1983.

have been rather vague, aside from periodic allusions to the broad character those responses might assume. Compared with the alternatives of emulating SDI or deploying aerodynamic systems to end-run it, most such allusions have reflected a preference for saturating or suppressing any defensive shield the United States might deploy. In an early Soviet reference along these lines, Academician Velikhov argued that any notion of a perfect defense was "dubious to the highest degree," since offensive forces "would immediately begin to be improved with the express aim of overcoming it."[10] Likewise, Academician Feoktistov, a deputy director at the Kurchatov Atomic Energy Institute, remarked in September 1983 that should the United States seek to deploy a comprehensive ABM, "the opposing side will create a numerical superabundance of attack missiles."[11] The following year, Feoktistov repeated this point, claiming that any space-based ABM would be "economically inviable at best. . . . If the means of attack are much cheaper, they will fulfill their mission simply by outnumbering the defensive instruments."[12]

Some Soviet commentators have intimated that Moscow might emulate SDI to deny Washington a monopoly in this critical area. *Izvestiia*'s Alexander Bovin, for example, asserted that the USSR "cannot take a passive attitude" in the face of SDI, "so we have to create a similar defense system."[13] Pronouncements along these lines have been the exception, however. More common have been statements implying that the USSR will respond to SDI with a mix of offensive and defensive counters, often with the added intimation that any defensive deployments will be purely reactive to SDI rather than an outgrowth of ABM programs already under way.[14] For the most part,

[10]"Science and Actual Problems in the Struggle Against the Threat of Nuclear War," *Mezhdunarodnaia zhizn*, No. 7, July 1983, pp. 21–32. Velikhov went on to note that the Soviet Union might also seek a capability for directly suppressing any U.S. BMD system in addition to pursuing improved offensive force penetrativity: "So-called 'defensive' weapons would be followed into space by an offensive weapon. . . . The deployment of antisatellite weapons would become inevitable."

[11]Speech at a Moscow conference entitled "Scientists Against the Threat of Nuclear War," May 17–19, 1983, in *Vestnik akademii nauk*, No. 9, September 1983.

[12]Interview in *Novoye vremya*, No. 42, October 1984. As with so many of the Soviet Union's statements about the feasibility and problems of ballistic missile defense, this one largely expresses criticisms that have been voiced against SDI by Western opponents of the program. The Soviets never talk in any detail about modern weapons and tactics unless these have already been amply discussed in the foreign press.

[13]Radio Moscow domestic service, July 8, 1984.

[14]For example, *Izvestiia* on January 25, 1985 proclaimed that the USSR would be compelled to respond to any SDI deployment "either by building up its own offensive forces directly or by supplementing them with means of defense." Georgii Arbatov implied much the same when he remarked that if the Americans "develop their defensive systems, then we must also develop not only our defensive systems but also missiles

these pronouncements seem to have been intended mainly as propaganda, perhaps to help deflect Western attention away from Soviet involvement in comparable activities, rather than to radiate official hints regarding the actual directions of Soviet counter-SDI planning.

In one case, however, the Soviets have produced a remarkably detailed survey of counter-SDI options that goes well beyond vague allusions and addresses highly specific systems, technologies, and operational concepts. This case involves an English-language compendium on space weaponry edited by Yevgenii Velikhov, Roald Sagdeyev, and Andrei Kokoshin and published under the auspices of the so-called "Soviet Scientists' Committee for the Defense of Peace Against the Nuclear Threat."[15] The volume appeared in late 1986 in an unusually handsome edition by Soviet standards. Without question, it was intended for a primary audience of Western defense professionals, and it was released in a manner obviously aimed at capturing the attention of the American media.[16]

Much of the book consists of a straightforward, responsible, and even absorbing descriptive account of the various concepts that might figure in a future American space-based BMD system. In one short chapter, however, it also presents a broad-ranging list of countermeasures the Soviets might employ against such a system. In keeping with earlier Soviet suggestions that Moscow's preferred options would probably involve offsetting rather than emulative reactions, the book stresses that "the main goal of the countermeasures would be to retain [Soviet] retaliatory capabilities sufficient to destroy the aggressor." These options are then broken down into active measures to destroy or neutralize SDI and both active and passive measures to penetrate or circumvent SDI through offensive force enhancements.

Active measures proposed by the book for suppressing SDI include:

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which would be able to penetrate their defense." Interview with Angelos Stangos, *Ta Nea* (Athens), January 31, 1985.

[15]Ye. Velikhov, R. Sagdeyev, and A. Kokoshin (eds.), *Weaponry in Space: The Dilemma of Security* (Mir Publishers, Moscow, 1986). An earlier document produced by the same group and widely cited in the West was entitled "The Strategic and International Political Consequences of Creating a Space-Based Antimissile System Using Directed-Energy Weapons." The latter appeared in both Russian and English and was signed to the press on April 21, 1984. For key excerpts, see "Space-Based Defenses: A Soviet Study," *Survival*, March-April, 1985, pp. 83–90. See also Dusko Doder, "Soviets See U.S. Deception," *Washington Post*, January 7, 1985; and Fred Kaplan, "Ploy or Warning, Soviet Study Stings," *Boston Globe*, January 13, 1985.

[16]Which it did. See, among numerous other accounts, William Beecher, "Soviet Study Warns 'Star Wars' Could Be Platform for Attack," *Boston Globe*, October 8, 1986; and Philip Taubman, "Moscow Planning Anti-Star Wars," *New York Times*, December 18, 1986.

- Fast-burning ABMs with appropriate shielding against high-power radiation for direct-ascent intercept of BMD battle stations in low orbit.
- Placement of space mines in orbits adjacent to an SDI constellation to destroy space-based BMD components by high-yield explosives detonated on ground command.
- Use of high-powered ground-based lasers, which would not be constrained by many of the limitations governing mass, size, power, dwell time, and so on that would affect space-based lasers.
- Obstacles and debris placed in the orbital paths of space-based BMD platforms.
- Nuclear detonations in the upper atmosphere to black out the most vulnerable elements of an SDI constellation relevant to surveillance, target acquisition, and tracking.[17]

As for active measures to penetrate or end-run SDI, the study notes the following alternatives:

- Increased numbers of ICBMs, decoys, and warheads to saturate enemy defenses.
- Use of depressed and lofted trajectories, launches in various directions, and randomly timed launches to confuse an SDI network and force it to squander its assets.
- Increased reliance on weapons unsusceptible to interception by SDI, such as SLBMs with depressed trajectories and large numbers of aerodynamic cruise missiles.

Among passive measures cited for maintaining Soviet retaliatory force penetrativity in the face of SDI are the following:

- Deployment of fast-burning ICBMs to minimize flight time during the most vulnerable boost phase.
- Altered missile exhaust plumes and brightness levels to impede target acquisition.
- Concealment of missile launch positions by smokescreens and other deceptive measures.
- Use of multilayered booster casings and ablative coatings, as well as highly reflective coatings and rapid booster rotation, to provide a degree of hardening against lasers.

[17]The study further notes (p. 100) that it would not be necessary to destroy an SDI system altogether but merely to "weaken this macrosystem by attacking its especially vulnerable elements, to break a hole in it so as to make it ineffective against the attacking ballistic missiles."

- Release of radar-reflecting chaff and infrared-absorbing aerosols during the midcourse phase to counter SDI sensors and interceptor guidance systems.

The report insists that Soviet countermeasures like these can be deployed in the near future with currently available technology. It also claims that such capabilities can be had for as little as 1 or 2 percent of the total cost of SDI. As we point out in the following section, this underestimates the likely cost of anything beyond a token offsetting response by a considerable margin. Nevertheless, the study offers a sophisticated contrast to those "countermeasures" propounded in the Soviet press that reflect more propaganda artistry than serious analysis, such as Valentin Falin's absurd allusion to "rocket bases on the moon" and his suggestion for filling space with "a mass of garbage that will liken a sophisticated detection and identification system to a bloodhound forced to follow a trail dusted with a mixture of tobacco and pepper."[18]

A final aspect of Soviet commentary on SDI countermeasures has been a rash of assertions, evidently inspired by a statement by former Defense Minister Sokolov in May 1985, that the USSR will not be driven down any investment path laid out for it by the United States. In an apparent bid to scotch any American hopes that Moscow might be lured into a competitive development of space-based defenses, Marshal Sokolov stressed that the Kremlin's programmatic decisions would be made solely with reference to Soviet interests, irrespective of any preferences the United States might have.[19] This refrain was subsequently echoed by the General Staff's point man on arms control, Colonel General Nikolai Chervov, in an interview with two American reporters: "We are not going to take the path that the U.S. administration is trying to force us into. . . . We have made it clear that we will not ape the United States in spending billions on space weapons."[20] In language almost identical to Sokolov's, yet a third Soviet military spokesman wrote that Moscow's responses could entail

[18]*Izvestiia*, December 14, 1984.

[19]TASS interview, reported in *Krasnaia zvezda*, May 5, 1985. Although novel in the context of SDI, this refrain had a precedent in more general Soviet strategic commentary. For example, Henry Trofimenko of Moscow's USA and Canada Institute observed in 1983 that "in giving an effective answer to Washington's military program . . . the USSR is not going to match the U.S. in development of every new system of weapons, nor is it going to imitate it." Quoted in Stephen Shenfield, "Soviets May Not Imitate Star Wars," *Bulletin of the Atomic Scientists*, June-July 1985, p. 38.

[20]Jim Hoagland and Dusko Doder, "Moscow Won't 'Ape' SDI, Top Soviet General Says," *Washington Post*, June 9, 1985. The phrasing of this statement leaves open the possibility that if the Soviets do develop a BMD system, it will employ traditional ground-based interceptors on which they have already been working for years.

measures "in the sphere of both defensive and offensive arms," but that "needless to say, the USSR will choose the methods of action most consonant with the interests of its defense capability rather than those which Washington figures would like to persuade it to choose."[21]

Similar remarks appeared shortly thereafter in a letter to the *Los Angeles Times* by Soviet "press correspondent" Alexander Malyshkin, who declared: "We in the Soviet Union don't exactly eat soup using our shoe for a spoon. Our national industry is capable of producing all types of weaponry. . . . It goes without saying that the USSR will choose methods of action that are most in the interests of its defensive capacity, not those that the U.S. administration would like to steer it toward."[22] Lieutenant General Mikhailov of the General Staff's Organizational Department said much the same in an interview with a German reporter, noting that instead of emulating SDI, the Soviet Union could increase the number of its ICBMs. He then added: "Even if SDI were to be 95 percent effective, the United States would not have gained anything," since it could be destroyed by only 5 percent of the USSR's warheads.[23]

Judging from Moscow's public reactions to date, the Soviet response to any SDI deployment, at least in the first go-around, will center on efforts to penetrate, circumvent, or suppress it (or, in the words of one Soviet officer, to render any such system "useless junk") rather than to copy it.[24] This raises the question of whether such pronouncements should be accepted at face value or treated with skepticism as intentional disinformation, particularly considering that one of the principal editors of the study, Andrei Kokoshin, is not a technologist but a Deputy Director of the Institute of the USA and Canada and one of

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[21]Major General A. Fedorov, "What Lies Behind the Publicity? The Truth About the U.S. Program for the Militarization of Space," *Krasnaia zvezda*, July 2, 1985.

[22]*Los Angeles Times*, July 22, 1985. Before long, Georgii Arbatov had incorporated this message into his own repertoire for Western audiences. In reply to a question about whether the Soviet Union would consider deep cuts in offensive forces, Arbatov reiterated a point (later confirmed by Gorbachev at Reykjavik) that any such possibility would be precluded by a continuation of SDI. In such an event, said Arbatov, "we have to increase our armaments, and we won't go the way the Americans want us to go, spending just as much money as you do on nothing in a mirror image of your efforts. We will work on weapons to counter this SDI." Quoted in Robert Scheer, "Arms Freeze Possible at Summit, Soviet Aide Says," *Los Angeles Times*, September 27, 1985.

[23]*Frankfurter Rundschau*, July 22, 1985. This last assertion echoes a flawed argument commonly made by Western critics of SDI, who wrongly assume that all (or even a large fraction) of the Soviet Union's warheads would be aimed against American cities to begin with. For a useful corrective, see Fred Hoffman, "The SDI in U.S. Nuclear Strategy," *International Security*, Summer 1985, p. 16.

[24]Colonel Vasilii Morozov, quoted in "Soviet Responses to Star Wars," *Seattle Post-Intelligencer*, December 1985.

the Soviet Union's most outspoken anti-SDI propagandists.[25] True enough, the response options thus far mentioned by the Soviets have, for the most part, remained limited to countermeasures that have been freely aired in the Western press. Furthermore, it is far from routine for the General Staff to share with the outside world the technical details of new weapons and force employment concepts it may be contemplating. Yet just because these options have dominated the Kremlin's propaganda posturing is no reason to rule them out as plausible alternatives in their own right. For one thing, many of them make sense from an operational and technical point of view. For another, they command the virtue of relative simplicity. As we will indicate in more detail shortly, there are significant cost advantages to be gained by the Soviets from forgoing emulation in favor of an offsetting or suppression response.

Most of the discussion in the West with regard to Soviet options for countering SDI has been directed toward measures involving ICBMs. By comparison, less attention has been devoted to the possibility of aerodynamic hedges in the form of bombers and cruise missiles, even though the Soviets have periodically included in their menu of potential SDI responses "a massive deployment of cruise missiles in various basing modes."[26] One such option would be to proliferate the AS-15 air-launched cruise missile (ALCM) carried by the BEAR H and BLACKJACK bombers. Another could involve the SS-N-21 submarine-launched cruise missile (SLCM), a weapon roughly comparable to the U.S. Tomahawk. This missile has a range of some 3000 km and can be fired out of the torpedo tubes of most classes of Soviet submarines. The Soviets have not specifically mentioned these systems as possible SDI counters. They have, however, pointed out in more general terms that as long as enemy radars are unable to detect cruise missiles, the latter can deny warning just as effectively as ballistic missiles.[27] This could indicate a substantial *real* underlying interest on their part.

Of course, one would not expect the Soviets to rely solely on bombers and cruise missiles in lieu of increased ICBM and SLBM penetrativity. First, many time-urgent targets would require the

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[25]Kokoshin is also reportedly a KGB officer. See "The KGB's Peacenik," *Foreign Report*, July 25, 1985.

[26]See, for example, *A Large-Scale Ballistic Missile Defense System and International Security*, Report of the Committee of Soviet Scientists for Peace and Against the Nuclear Threat (Izdatel'stvo "Novosti," Moscow, February 1986), pp. 62–63.

[27]The former Chief of the General Staff, Marshal Ogarkov, made a remark to this effect during a Foreign Ministry press conference broadcast on Radio Moscow international service, December 5, 1983.

delivery speed and short warning time that only ballistic weapons can provide. Second, cruise missiles cannot be controlled as closely as ICBMs because of communications problems associated with the way they are deployed. Third, any determined pursuit of a cruise missile counter to SDI by the Soviets would require them to create a sea-based and air-launched force virtually from scratch. Unlike the United States, the Soviet Union does not have much of a tradition when it comes to aerodynamic delivery of nuclear weapons against targets at intercontinental ranges, and any such effort would have to contend with a powerful Strategic Rocket Forces (SRF) legacy.

Nevertheless, Soviet planners are not unmindful of the aerodynamic option for subverting SDI. Should both sides find themselves increasingly driven down that path, the Soviets will enjoy the relative advantage of having a far superior homeland air defense network. They also undoubtedly appreciate the promise offered by low-observable technology for reducing the warning time associated with a cruise missile attack. Significantly, the Soviets have repeatedly flown the BEAR H ALCM carrier in the last few years on mission profiles simulating an attack against the United States.[28] Although Soviet writings have not mentioned these flights or alluded to their purpose, their occurrence has nevertheless sparked renewed American concern for air defense within the larger context of SDI.[29]

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[28]Soviet interest in possible Western hemisphere basing, such as in Nicaragua, where runways are now being lengthened, and developments in their cruise-missile submarine force will be further indicators to watch.

[29]See David J. Lynch, "U.S. Considers Air Defense Shield," *Defense Week*, June 23, 1986, pp. 1, 12.

VII. FACTORS AFFECTING SOVIET SDI RESPONSES

A useful way of considering how the USSR may deal with SDI once the time comes is to distinguish short-term from longer-term responses. By short term, we have in mind the immediate policy context associated with the ongoing superpower arms control dialogue. By longer term, we mean that period out to around 1995, by which time most currently conceived Soviet technical counters to SDI will be in a position to register at least the beginnings of deployment.[1]

Defined as such, the short-term Soviet response has really been under way almost from the day Moscow's anti-SDI propaganda line first coalesced in 1984. The main effort here has involved a determined campaign to subvert SDI politically through a variety of divide-and-conquer tactics before it can gain enough momentum to pose a tangible military threat. This campaign has featured a twofold assault aimed at driving a wedge between the United States and its allies and at fomenting domestic opposition to SDI, both within and outside the American defense policy community.

On the first count, the Soviets have sought to erode the allies' support for SDI by playing on their fears of nuclear war, of being left exposed by a U.S. defensive umbrella that would offer them no protection, and of having their "good relations" with the Soviet Union compromised as a result of their associations with SDI.[2] This campaign has reached well beyond Western Europe to address other friendly countries as diverse as Japan and Israel. It has also pressed into service some of the most ranking officials of the Soviet leadership, who have repeatedly taken to the hustings against SDI in visits to Western capitals.

On the second count, Moscow has targeted the American media and those opinion elites predisposed against SDI in a calculated effort to erode whatever popular consensus that may now underlie SDI. This

[1]For reasons that will be discussed in the next section, any attempt to anticipate Moscow's responses beyond that horizon would be almost entirely speculative, given the absence yet of any clear signs of likely Soviet development preferences, to say nothing of the uncertainties surrounding SDI itself.

[2]As an example of this sort of browbeating, then-Foreign Minister Gromyko personally informed his West German counterpart in early 1985 that the Kremlin would view the Bonn government as an "accomplice" in violating the ABM Treaty if it helped the United States with SDI. See "Kremlin Warns Bonn Against Role in U.S. Star Wars Project," *Los Angeles Times*, March 5, 1985.

effort has drawn on such support as the study by Velikhov, Sagdeyev, and Kokoshin described above to help feed doubt about the feasibility of a space-based ABM. It has further exploited the natural yearning of Americans for arms control by playing to the grandstands with a variety of tantalizing force reduction enticements, while holding out in the negotiating arena in the hope that the Reagan administration's position on SDI will be forced to bend under the pressure of public opinion. This activity suggests that Moscow's arms control posturing remains in a highly tactical phase. Yet it also reflects the Soviet leadership's appreciation that democratic systems like ours are highly susceptible to disruptive influences (including arms control stratagems) aimed at programs that require sustained support, often over the course of several administrations, to reach full operational capability.[3]

Should this combined propaganda and arms control offensive fail to halt SDI, assuming that the latter does not succumb to more proximate causes, the Soviets will have to turn to more tangible responses whose feasibility and cost are surely being debated intensely within the Kremlin today. Regardless of Moscow's near-term expectations of SDI's fate, one can be assured that Soviet planners are devising a full menu of technological response options. How these options will evolve and which may see deployment can only be guessed at for now. As the Soviets themselves have pointed out, "the full picture of possible countermeasures will emerge [only] when a large-scale BMD concept finally takes shape."[4] Yet we can identify some of the factors that will bear most heavily on whatever choices the Soviets ultimately adopt.

Should SDI continue to the point of forcing Moscow to react with actual development programs rather than merely R&D hedges, the options available will be bounded first and foremost by the constraints of Soviet technology and engineering style. For the period out to about the middle of the 1990s, any Soviet programmatic response will necessarily draw on concepts and capabilities already in hand. For the decade following, the menu of options will be broader. Even then, however, the Soviets will be limited by technologies and design

[3]A notable example of Moscow's effort to reach U.S. opinion came in the form of a slick multicolored pamphlet entitled *Star Wars: Delusions and Dangers*, published by the Soviet Defense Ministry and widely circulated in the United States (see Bill Gertz, "Soviets Acknowledge Space Weapons Research in New 'Star Wars' Booklet," *Washington Times*, August 22, 1985). Moscow's dissemination of that tract prompted the U.S. Defense Department shortly thereafter to counter with its own pamphlet summarizing U.S. knowledge about Soviet involvement in SDI-related programs, in the latest round of what has now become a regular U.S.-Soviet competition in strategic "brochuremanship." On the latter document, see "Soviet Star Wars," *Time*, October 14, 1985, p. 28.

[4]*A Large-Scale Ballistic Missile Defense System and International Security*, Report of the Committee of Soviet Scientists for Peace and Against the Nuclear Threat (Izdatel'stvo "Novosti," Moscow, February 1986), p. 57.

concepts generated by investment choices that will be made in the next few years. One of the problems posed for the Kremlin by the multilayered defense scheme envisaged by SDI is the need to react not only to a demanding challenge but also to a multifaceted one. By concurrently exploring a broad range of boost-phase, midcourse, and terminal intercept configurations, SDI could force Moscow to concentrate its resources against each of these threats simultaneously as a necessary price for vouchsafing the offensive capabilities it currently enjoys. Obviously, that would stress Soviet R&D far more than would the need simply to counter a single U.S. BMD component.[5]

Even in the best of circumstances, competing with a determined SDI threat will confront the Soviets with a pronounced uphill climb technologically. According to a study prepared for the U.S. Congress in 1985, the United States is at least equivalent to the Soviets in power sources and directed energy, and is ahead in such key SDI-related areas as sensors, signal processing capability, optics, microelectronics, computers, and software.[6] A similar finding was reported in 1986 by the Under Secretary of Defense Research and Engineering, who authoritatively stated that the United States was equal or superior to the Soviet Union in the 20 most important areas of technology associated with space-based ballistic missile defenses.[7]

Compounding this disadvantage facing Moscow as a result of its technological insufficiency in many crucial areas is a parallel shortage of management sophistication and organizational efficiency. Of course, the Soviets have frequently compensated for such shortcomings by the imposition of brute-force solutions. Nevertheless, the Soviet R&D

[5]In this connection, it is important that in our own threat response modelling, SDI planners use both realistic extrapolations and an adequate range of bounding scenarios of what the Soviets are likely to come up with, based on *all* available knowledge of Soviet design practices and engineering strengths and weaknesses, rather than merely compounding worst-case projections of the countermeasures our *own* technology might produce in an ideal world. Otherwise, we may face the needless complication of designing SDI defenses against near-perfect Soviet counters, rather than against the substantially less sophisticated ones we are more likely to encounter in actuality. In the long run, adherence to excessively demanding performance specifications can lead to the downfall of SDI. For an amplification on the logic behind this assertion, see Benjamin S. Lambeth, "Pitfalls in Force Planning: Structuring America's Tactical Air Arm," *International Security*, Fall 1985, pp. 84–120. The principles outlined in that discussion regarding the need to bound the threat in fighter force development are equally applicable to the BMD business, even though the technologies involved may be very different.

[6]U.S. Congress, Office of Technology Assessment, *Ballistic Missile Defense Technologies*, OTA-ISC-254 (Government Printing Office, Washington, D.C., September 1985), p. 12.

[7]U.S. Under Secretary of Defense, Research and Engineering, *The FY1987 Department of Defense Program for Research and Development* (Government Printing Office, Washington, D.C., 1986), p. II-11.

infrastructure is highly fragmented and compartmented, with little sharing of information across disciplines. Furthermore, according to a recent study by the Council on Economic Priorities, budgetary allocations for applied R&D are often apportioned to "pet projects of the most influential officials" rather than on the basis of objective strategic need.[8] In the absence of high-level political direction and at least the rudiments of a Soviet counterpart to SDIO, this ingrained organizational inertia will increase the likelihood that any Soviet effort to offset SDI will face rough going.

Granted, the Soviets are scarcely unmindful of this deficiency. As a part of Gorbachev's general restructuring of the Soviet R&D and industrial base, a radical new organizational development called the interbranch science and technology complex (or MNTK, in its Russian acronym) has begun to take place. Although there is no reason to believe that SDI, in and of itself, has been a prime driver behind this endeavor, a successful implementation of the MNTK concept would go far toward eradicating Moscow's long-standing problem of introducing results of high-technology R&D into production and might well move Soviet technology (including BMD technology) far closer to a par with Western accomplishments. Thus far, however, this effort seems to have remained hamstrung by a continued absence of sufficient incentives for industrial innovation and an evident reluctance on the part of the pertinent ministries and production entities to alter their old ways of doing business. Accordingly, although the MNTK experiment plainly reflects Gorbachev's concern and determination to make the USSR more competitive technologically, all signs up to now indicate that this effort is not yielding results anywhere close to its promise because of the persistence of structural impediments in the Soviet system.[9]

Moscow's responses will also be determined in part by the extent to which SDI is eventually allowed by the United States to become an arms control bargaining counter. Although an unrestrained SDI could place major stress on the Soviet military-technical establishment, a U.S. BMD effort moderated or stretched out in return for Soviet concessions on other fronts might substantially ease those pressures and allow Soviet planners to redirect their energies toward other important mission needs.

Thus far, it has consistently been stated U.S. government policy that SDI research and testing permitted by the ABM Treaty will not

[8]Quoted in David Wood, "Study Doubts Soviet Star Wars Ability," *Newark Star Ledger*, January 1, 1986.

[9]For further discussion, see Simon Kassel, *Soviet High-Technology Restructuring Drive: The MNTK Network*, The RAND Corporation, N-2612-DARPA, August 1987.

be extended as a bargaining chip, irrespective of whatever the Soviets might offer in the arms reduction arena. Yet at the same time, the Reagan administration undoubtedly appreciates the enormous potential of SDI to drive Soviet strategic programs away from directions uncongenial to Western security interests, as amply attested by the enthusiasm of Moscow's arms control offerings to date. Almost never before has the Soviet Union shown itself willing to trade Soviet capabilities in the field for only *potential* American capabilities. Usually, the situation has been the other way around, with the *Soviet Union* being the country unwilling to give up a bird in the hand for two in the bush.

It is not inconceivable, therefore, that after hanging tough long enough to smoke the Soviets out in the arms control arena, the administration (or its successor) may become more inclined to consider certain SDI constraints as an acceptable trade for an arms control breakthrough that imposes countervailing limitations on the most disturbing trends in Soviet ICBM development (such as increased MIRV fractionation and the ability to evade U.S. verification through concealment and mobility). Of course, in the absence of any way to anticipate such limitations, there is no telling how the arms control process will affect Moscow's responses to SDI. Whatever comes of the present U.S. government stance regarding SDI as arms control currency, however, Soviet planners will be keenly interested in the outcome of START as they go about framing their hedges against SDI for the coming decade.

Beyond the capabilities and limitations of Soviet R&D, over which the United States has virtually no control, and the vagaries of the arms control process, which could render the whole question of Soviet SDI responses moot, there are additional factors that will influence Moscow's reactions to SDI, whatever technical or operational contours it may assume. These include: (a) Soviet expectations based on their memory of past U.S. behavior with regard to strategic defenses; (b) the programmatic staying power of SDI over the long haul; (c) the outcome of internal Soviet political and bureaucratic maneuvering over the question of SDI responses; (d) the extent to which Soviet military doctrine is allowed to inform Moscow's counter-SDI choices; and perhaps most important (e) the breadth of fiscal and technological resources the Soviets will ultimately be able to mobilize against SDI during a time of mounting internal economic duress.

MOSCOW'S RECALL OF PAST U.S. STRATEGIC DEFENSE EFFORTS

Although the Soviet leadership faces many problems in trying to counter SDI, this difficulty may be somewhat eased by the fact that the United States has not shown a notably impressive record of sustaining military programs, especially controversial strategic ones, that have required the support of multiple budget cycles to come to fruition.[10] This has especially been the case with respect to strategic defense. As any observant Soviet planner knows, there is a precedent for American involvement in continental defense during the 1950s and 1960s that, for its time, was as long on technological wizardry as SDI is today, yet in the end proved to be much shorter on programmatic and doctrinal durability.

Western discussion of possible Soviet responses to SDI has paid little heed to this historical matrix. Instead, there has been a tendency to view the recent rejuvenation of American interest in strategic defense as some sort of *deus ex machina.* Judging solely from most of the public controversy since President Reagan's March 1983 announcement, one would have to conclude that there were no precedents to SDI in the history of U.S. strategic policy. Rather, it would seem that a decade or more of apparent strategic defensive neglect had been abruptly ended by a landmark presidential statement and some belated realignments of military budget priorities.

In fact, the common American view has been neither comprehensive nor entirely correct when it has come to reflective thinking about home defense. All too often, U.S. specialists allude casually to a "withering away of" or a "traditional lack of American interest in" strategic defense and leave things at that. Yet there are numerous facts, trends, and philosophical orientations that could be unearthed in even a cursory overview that are quite inconsistent with much of the popular mythology surrounding strategic defense in the United States. This history may have great relevance to the Soviets in any future SDI-motivated arms competition. Being naturally inclined toward the long view, Soviet planners will surely be mindful of this pattern. As such, they may consider their SDI response needs within the framework of a *decades*-old, rather than merely *years*-old, American approach to home defense.[11]

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[10]This fact has scarcely gone unnoticed by SDI's domestic critics. See, for example, William H. Kincade, "Star Wars May Not Survive Time, Technology, and Money," *Los Angeles Times*, May 19, 1985.

[11]Whether the Soviet threat assessment community can distance itself from its many political, ideological, and cultural sources of interference to draw such lessons of history without distortions is a question we cannot answer. However, it seems fair to assume the

Of course, any Soviet attempt to evaluate SDI in light of past American behavior will have to tangle with the problem of finding consistency in the face of a strong American proclivity for abrupt shifts in priorities, often unpredictable stabs at experimentation, and the pursuit of unclear or even incoherent policies on what, to a Kremlin planner accustomed to great organizational regularity, must appear to be a scale occasionally bordering on the incredible. Nevertheless, we can be sure that Soviet planners will make at least *some* effort to couch SDI in the context of broader U.S. strategic conduct when it comes to designing and carrying out their own responsive force policy.

To begin with, any aware Soviet planner is bound to appreciate that continental defense has been an enormously political matter throughout American history. As a national agenda item, few things have been as guaranteed to get the American electorate as riled up as alleged derelictions of home defense duties. Yet developments in technology, especially during the past quarter of a century, have presented enormous challenges to this traditional attitude. The confusion and acrimony surrounding our domestic debates over strategic defense since the beginning of the missile era reveal the minimal degree to which basic attitudes and modern realities have been reconciled.

The resultant chaos, at least to an outsider, has been both a symptom and an explanation of why various "epochs" in U.S. strategic defense, including the current one centered on SDI, have been so closely associated with discrete administrations. Any astute Soviet "America hand" will be aware that doctrinal and programmatic shifts involving home defenses have often been carefully camouflaged—or deliberately made conspicuous—for important political reasons.[12] Even so, fundamental beliefs persist and might be expected by Soviet analysts to remain important influences on the future of SDI and American thinking about it.

Second, since the dawn of the nuclear age, "deterrence by punishment" has been a central focus of American nuclear policy, and the concept of mutual vulnerability has long underlain U.S. preparations for nuclear employment. In effect, the threat of retaliation has been almost universally perceived in the United States as the only dependable means for deterring a Soviet attack. Accordingly, a major theme

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existence, at least in principle, of opportunities within the Soviet analytic hierarchy for realizing something approximating an objective, big-picture historical understanding of crucial trends, with the results of such understanding being couched in terms suitable for informing Soviet defense planning.

[12]For example, some commentators noted that the timing, tone, and content of President Reagan's 1983 SDI speech had a salutary effect, at least from an administration point of view, in heading off Congressional efforts to reduce the FY1984 defense budget submission.

of U.S. *defensive* planning has concerned assuring the viability of our nuclear counterattack options. Indeed, the preservation of American retaliatory options has often been the *only* function of our strategic defense assets. A critical issue for any Soviet planner will thus center on the distinction between the historical primacy of continental defenses as critical adjuncts of U.S. *retaliatory* power and their utility, as the Soviets themselves envision them, as capabilities to help enforce a *denial* strategy.

In short, any Soviet assessor reviewing the history of American strategic defense will be inclined to conclude, and rightly so, that most of the important programmatic shifts have involved warning, command and control, and related functions in support of offenses. To illustrate, the main role of American air defenses in the 1950s was to help get the Strategic Air Command safely off the ground. In the early 1960s, the emergence of a Soviet combat repertoire including ICBMs made tactical warning even more important, to the point where actual intercept capabilities played second fiddle to crash efforts aiming at filling vital warning gaps. A decade later, the continued refinement of employment options placed a further premium on warning and assessment as the possibility of limited Soviet nuclear attacks and related operational issues assumed heightened importance. Most recently, our growing involvement in space has made unimpeded access to that arena more critical than in previous years.

Third, there has typically been little institutional support for home defense in the United States. Despite the recent advent of SDIO and Space Command, we have never maintained any defensive organization that has rivalled the Soviet Union's *Voiska* PVO in prestige, bureaucratic stature, or budgetary endowment.[13] Since the mid-1950s, air and missile defense in the USSR has enjoyed a degree of corporate autonomy and a captive roster of design bureaus that the United States has never known, even during the height of our deployment of substantial defenses against Soviet bombers. Even as the USSR has achieved strategic superiority in some areas and recognized the need to abandon outmoded practices in others, the primacy it has accorded to defending Mother Russia has never faltered.

The American experience has been very different from this Soviet paradigm. In the United States, strategic defense has typically been a

[13]The U.S. Air Defense Command is no exception. From its postwar beginnings, it always stood in the shadow of the other USAF major commands, especially SAC. In the early 1980s, its interceptor component was integrated into the Tactical Air Command as ADTAC (now 1st Air Force) under the command of a Major General. Today, USAF interceptor pilots train, by and large, as generic air-to-air fighter pilots, and the Air Defense Command has been disestablished.

stepchild of the various armed services. And in each service, home defense has been at the forefront of those undertakings abandoned when other priorities (such as Vietnam) have intervened.[14] As a result, U.S. air defenses today consist mainly of hand-me-downs and multi-scenario augmentation forces, and our CONUS defense "modernization" priorities are drawn up with tactical air requirements heavily in mind.[15]

Beyond that, there has been limited continuity among the most senior military personnel involved with strategic defense. The Office of the Secretary of Defense has likewise shown little abiding interest in continental defense as a mission area. And *civil* defense has been kicked from pillar to post by virtually everybody since the 1950s and has almost no chance of generating anything more than token support, regardless of where the responsibility for it may reside.

Indeed, none of the U.S. services over the past four decades has really appeared to *want* the strategic defense mission. Yet bureaucratically, the only thing worse than being compelled to function in that role has been having another service stake out a claim for it. This was perhaps most strikingly illustrated by the tri-service scramble in the 1950s to develop a national homeland-defense SAM, with the Army advancing Nike Ajax and Hercules, the Air Force BOMARC, and the Navy TALOS. Even then, however, those were all low-priority efforts within their respective services. Perhaps most tellingly, Air Force and Army disagreements over ASAT and ABM roles have been attributable more to service rivalries and other ancillary motives (such as, for the Air Force, the refinement of penetration aids requirements) than to any commitment to "the strategic defense mission" as an end in itself.

Hitherto, then, American behavior with regard to continental defense has been quite stereotyped. The lack of adequate funding to

[14]The effects of the Vietnam war on the strategic balance are impossible to quantify with any accuracy. Yet they were enormous, however the specific numbers might come out. With respect to the present analysis, it is worth noting that during the middle and late 1960s, there was *not even any mention* of the Army's ongoing ABM effort in the Secretary of the Army's annual Posture Statement. Thanks to Vietnam, not even a partialist approach to air or ballistic missile defense was pursued.

[15]As an illustration, USAF and Air National Guard interceptor squadrons that formerly operated the F-4 and F-106 are being upgraded with the F-15 and F-16, both designed and principally employed as air superiority fighters (the F-16 having a secondary ground-attack capability). In a recent "Air Defense Fighter" flyoff, the USAF selected a modified F-16 over the Northrop F-20 for further upgrades of Air Guard interceptor units. Although this decision will clearly give the tactical air forces an improved multirole fighter for potential overseas commitment in time of war, many observers have noted that *neither* the F-16 nor the F-20 was an appropriate choice, because of avionics, weapons, and endurance limitations, for the CONUS air defense mission. Were the United States truly serious about that mission, it would, by this account, have resorted across the board to more capable interceptors such as the F-15 or the Navy's F-14.

deploy an effective counter to even a portion of the Soviet offensive threat, let alone all of it, has frequently inspired a vicious programmatic circle. The result has all too often been either an abandonment of defensive efforts altogether or a dramatic lowering of their mission performance criteria, such as replacing damage limitation with "protecting national air sovereignty" as a goal of U.S. air defense during the 1960s, rather than acceptance and refinement of more modest partial solutions. In fact, programs with originally ambitious goals, the SAFEGUARD ABM notable among them, have often been accompanied in their cancellation by doctrinally couched expressions of *relief* that an expensive and ineffective squandering of national resources has been avoided thanks to "prudent management" and systems analysis.

Relatedly, making a virtue of economic, technological, or political necessity has repeatedly led to a diminution of selected components of the overall threat by U.S. defense policy and to a tendency to ignore other components, as McNamara did when he rejected the idea of trying to stop Soviet bombers when Soviet ICBMs would have a free ride. This, in turn, has inspired an iterative syndrome in which the subsequent degradation of residual defense capabilities has proven increasingly convenient. A classic example was the closing down of the single U.S. ABM site at Grand Forks, North Dakota, in 1974 shortly after it went operational.

To put the point differently, had the budget authority and the technology required to counter an emerging Soviet ICBM threat (and, of course, the absence of a resource-diverting war in Southeast Asia) been in hand in the late 1960s and early 1970s, the decline in U.S. *air* defenses during that period, rationalized by the refrain that it made no sense to meet just one aspect of the Soviet threat, might not have occurred to the extent that it did. This is not to say that there is no virtue in what Soviet planners might regard as a philosophical cloud obscuring American thinking on the question of strategic defense. Perhaps it really *was* better for the United States to put aside attempts to invest against only a portion of the Soviet offensive threat by procuring antibomber defenses in the interest of a fuller funding of more worthy enterprises, such as a robust Triad, than it might have been to accept "death by a thousand cuts" decrements in many programs across the board. The traditionally high funding level for Soviet military programs has not forced Soviet planners, at least until recently, to confront this dilemma to the same degree as it has us. An interesting question for analysis is whether the Soviets are *capable* of rising above their own doctrinal orientations to perceive this basic fact regarding American behavior, or whether they view our activities as either inexplicable aberrations or devious attempts at deception.

With the advent of SDI, the relationship between American defenses and the Soviet forces they are intended to counter has undoubtedly emerged as a topic of special interest to Soviet planners. Why, they might wonder, despite SDI and the appearance of a resurgent Soviet aerodynamic threat in the form of BEAR H and BLACKJACK, does the number of programmed U.S. *air* defense squadrons continue to decline rather than grow? Seeming contradictions of this sort can have two explanations in Soviet eyes. First, in contrast to Soviet practice, the fact that ballistic missile defense has remained intractable while bomber defense has continued to be operationally feasible has traditionally provided the United States with a strong incentive to do nothing. Tight budgets have supported such reasoning with almost clockwork regularity. Second, most of the development emphasis in American strategic defense has focused on the high end of the Soviet threat. Yet efforts to contend with lesser aspects of the threat have rarely been supported. Instead, they have been deferred to be pursued only after the more troublesome portions can be accommodated. In the case of SDI, this can be seen in our persistent neglect of counterairbreathing systems, even as defense against ballistic missiles has assumed heightened importance.

Finally, strategic defenses in the United States have often been victims of significant doctrinal preconceptions—even, in some cases, quite erroneous or questionable ones. For example, defenses have been widely held to be inferior to offenses when it has come not only to deterrence, but also to the attainment of war aims should deterrence fail. In competitions for budgetary allocations between offensive and defensive programs, Americans have, perhaps unfairly at times, tended to place the burden of proof on the defense. Whereas just a few threat parameters have normally sufficed to inform offensive penetration plans, defensive threat requirements have typically been made to appear far more daunting. To cite just one case in point, offensive forces are often assumed to be capable of evading defenses merely by changing their tactics, something that can usually be done without major hardware adjustments.[16] By contrast, the defender is more commonly obliged to come up with far-reaching technical and other time-

[16]For example, in 1951 the USAF began a study of future bomber penetration requirements and concluded that the only solution to steadily improving Soviet air defenses lay in low-altitude ingress to avoid enemy radar detection. By the mid-1950s, the B-52G was designed with the aerodynamic stresses of the low-level mission principally in mind. By the late 1950s, low-altitude ingress had become the standard SAC penetration profile. A B-58 graphically demonstrated this technique in September 1959 by flying nonstop from Carswell AFB, Texas, to Edwards AFB, California, at a speed of Mach 0.93 and at an altitude of never more than 500 ft. Bill Gunston, *Bombers of the West* (Charles Scribners Sons, New York, 1973), pp. 174, 195, 207.

consuming changes to accommodate new operational conditions imposed by the offense

What may be of greatest concern to Soviet planners charged with assessing SDI, therefore, is that the offensive inclinations of American strategy have all too often masqueraded as "defensive" enterprises, at least as the Soviets might view it. This may go far toward accounting for the almost reflexive Soviet depiction of SDI as a natural reflection of alleged American "first-strike" ambitions. Indeed, U.S. defenses over the past three decades *have* shown a strong pattern of having been pursued mainly to help get our offensive forces out of harm's way in case of war. Yet in this subordinate role, defenses have also typically been the first to go when budgets have become tight or when Americans have identified higher military or social priorities. Consequently, a well-informed Soviet observer would not be making predictions wildly out of keeping with the historical record if he bet on the low staying power of SDI over the long haul.

THE POLITICAL AND PROGRAMMATIC DURABILITY OF SDI

With this background in mind, we must now consider what may be sufficiently "new" about SDI to make a Soviet planner question the validity of past U.S. home defense trends as a basis for projecting future American behavior. In our judgment, the evolution of SDI has not been such, at least yet, as to suggest any imminent radical departure from well-established historical patterns, although this could easily change as SDI continues to unfold. Moreover, the extent to which a Soviet planner might rightly regard the American past as some sort of prologue where strategic defenses are concerned will depend on a number of factors, many of which are decidedly nonmilitary.

Conceptually, SDI is an enormously novel development. What makes it unique as an innovation in its own right is not so much the exotic hardware being proposed as its prospect of altering the whole matrix in which the nuclear balance currently resides. Indeed, it is not an exaggeration to compare SDI, even in the near term, to Polaris and MIRV when it comes to its ultimate potential significance. What the latter did, and what the former could do in the future, is to precipitate a major reappraisal of where the strategic world is headed.

To note just one example of SDI's capriciousness as a Soviet planner might view it, however, one need only recall that the program is quintessentially a personal artifact of President Reagan's. For that reason alone, an eventual transformation of SDI, perhaps driven more

by political and fiscal developments than anything else, is not beyond consideration. Even leaving aside that possibility, a Soviet planner will probably be inclined to attribute continued validity to the pattern of U.S. defensive planning described above for several reasons.

First, *no* amount of SDI-induced politicization, at least in the near term, is likely to change broad American strategic policy trends that have been steadily evolving, often for good reasons, for more than two decades. Second, even if a new strategic doctrine were unreservedly embraced by the United States, there is ample precedent for the eventual adoption of halfway solutions in which many vestiges of past practice would remain in force. Third, the progressive fusion of strategic and tactical defense technologies could lead to a redirection of the original SDI concept toward a more traditional theater orientation than some proposed SDI architectures now envision. In some cases, familiar tendencies will persist. In other cases, there will be change, possibly major change. The challenge to the Soviet analyst is how to sort out these various prospects in appraising this seemingly "maverick" SDI against the backdrop of fairly consistent American patterns with regard to strategic defense up to now.

One area that will be watched with special interest by Soviet planners responsible for comparing old and new American behavior will be the bureaucratic setting in which key defensive developments take place. In this respect, the formation of the Strategic Defense Initiative Organization is something very new under the sun. As noted above, a major reason why the United States never managed to achieve a strategic defense program with much continuity in the past was the persistent lack of an adequate bureaucratic base. Several developments in recent years are thus highly significant. These include the JCS recommendation and subsequent Presidential action approving the creation of a unified Space Command; the construction of the Consolidated Space Operations Center (CSOC) at Peterson AFB, Colorado; the establishment of a military spaceport at Vandenberg AFB, California; and, of course, the SDIO itself. In our judgment, academic writers frequently exaggerate the importance of "bureaucratic politics" as a determinant of American foreign and defense policy. Yet in the case of organizational support for strategic defense, the difference between the present situation and the one that existed throughout much of our postwar history is great enough to invite special notice.

The emergence of a large bureaucratic apparatus around SDI portends several important departures from past practice. For one thing, the mere *existence* of such an apparatus will help assure more sustained fiscal support for strategic defense than was previously the case. Second, the marshalling of various BMD efforts under a centralized

management entity should improve the integration and direction of the overall enterprise. Third, SDI's heightened bureaucratic stature has engendered a commensurate increase in institutional visibility on its part that should in principle lead to greater corporate accountability—and perhaps even *higher* programmatic status. Fourth, the unified and directed nature of SDI should contribute to a steady growth in its priority compared with other efforts.[17] For example, the existence of SDIO should assure more ready access by SDI payloads to space launcher availability. It may also force a reorientation of certain laser development efforts that might have followed different lines in the absence of SDI. Finally, we can expect greater coherence in various associated development activities, such as high-speed computer software and hardware, that will gain heightened prominence as a result of their relationship with SDI. None of this will be lost on the Soviets.

Another dimension that will figure centrally in Moscow's assessment of SDI's durability will be the steadiness of funding support it receives, especially under the administration that succeeds the present one. In the eyes of the average American today, SDI *seems* to represent a major break from the past because of the low priority we assigned to strategic defense for many years preceding it. In fact, however, there have been times when considerable sums were invested in U.S. continental defense. Soviet students of American practice will be well aware of the pertinent history in this regard. And *their* understanding, rather than the prevailing wisdom of often poorly informed American observers, will play the dominant role in shaping their assessment of the durability of SDI. To a Soviet planner, the burden of proof will lie in American actions rather than leadership rhetoric. Given the consistency of our earlier home defense efforts, it will be the budgetary priority the U.S. government accords SDI over time that will mainly convince Soviet observers whether or not there has been a changed tune in comparison with previous approaches.

In all, Soviet assessors of SDI face some vexing analytical dilemmas. It is still too early to say how far technologically or programmatically the current effort will go. Some ideas now being explored as a part of SDI were initially funded not only before SDI was conceived, but in some cases before Ronald Reagan became President. Yet in many of these cases, there has been considerable program expansion (or

[17]This trend has already left its mark on the USAF's tactical fighter force structure. Because of budgetary shortfalls associated with SDI funding requirements, the Air Force has been forced to slip indefinitely its goal of achieving 40 fighter wings by the early 1990s. See Richard Halloran, "Air Force Is Cutting Fighter Units in Nuclear Shift," *New York Times*, January 7, 1987.

acceleration or consolidation) as a result of SDI. The Soviets can only speculate about what elements of SDI will ultimately see the light of day that might not have emerged in the absence of President Reagan's initiative.

This presents the Soviets with some difficult challenges as they seek to anticipate their SDI responses. Of concern here are those hedges that might be at least partly informed by a review of "lessons" from past U.S. behavior with regard to strategic defenses. Any Soviet planner familiar with the peregrinations of American defense activities over the past four decades will most likely assign nontrivial probabilities to two alternative outcomes: (1) that SDI, as presently conceived, could change dramatically in its characteristics and goals over time, or (2) that the program could eventually see extensive slippage of key development and procurement decisions—and perhaps even outright cancellation. In other words, SDI could prove to entail sacrifices deemed unacceptable in light of other pressing national commitments. Or it could succumb to the preferences of a new administration guided by more traditional attitudes toward deterrence.

On the other hand, any hope of this sort must give Soviet planners cold comfort in light of the remarkable persistence SDI has shown, at least so far, since President Reagan announced it four years ago. Unlike so many other American defense "initiatives," such as the multiplicity of basing schemes for MX that have come and gone over that program's troubled history, SDI is almost surely not regarded by the Soviets as anything like the "flavor of the week" in American strategic policy. On the contrary, it has acquired a substantial bureaucratic foundation, consistently generous budgetary support, and the unambiguous backing of the President, who has personally taken the lead in giving the program direction and vitality. It also entails a variety of technologies that could eventually have *at least* as great an impact on prevailing deterrence strategies as did the advent of secure second-strike forces. Even if the present vector of SDI becomes diverted by any number of political, technical, or budgetary problems, a more est development of just a few of its technologies under investigation could still generate massive headaches for the Soviets—and perhaps in areas only remotely connected to intercontinental nuclear war.

Consequently, a cautious Soviet planner cannot rule out the prospect that a convergence of the right developments could result either in a robust SDI deployment or a diversion of SDI technologies to other arenas, such as theater defense. The assignment of probabilities to these and other outcomes, of course, is bound to be fruitless. Judging by our track record, however, the smart Soviet planner will probably put his rubles on some forecast dominated by a failure of SDI to follow any

roadmap currently in vogue. Moreover, since our defenses have been intimately tied to our offensive force planning since the early 1950s, the Soviets will almost surely continue to discount American assertions that the goal of SDI (perhaps in conjunction with arms control) is the general elimination of the nuclear specter. Instead, they may be more inclined to view SDI as, at best, a camouflaged attempt to enhance U.S. nuclear employment options and strategic offensive potential at the Soviet Union's expense.

SOVIET INSTITUTIONAL POLITICS

Although the USSR is not fettered by many of the domestic influences that often complicate defense management in pluralistic societies like our own, there are nonetheless numerous constituencies with competing interests in whatever decisions the Soviets may eventually reach regarding counters to SDI.

Like most military bureaucracies, Soviet defense institutions do not respond to outside stimuli in an entirely predictable way. Rather, their actions flow from a complex set of personal, organizational, and other influences and interrelations. Any balanced assessment of how Soviet institutional processes will affect the Kremlin's response to SDI must first identify who the respondents will be and what precise dimensions of SDI they will be countering.

All too often, there is a tendency in Western practice to refer without qualification to some generic "Soviet" reaction to this or that external challenge. This tendency results from a number of factors, including widespread assumptions about the apparently monolithic nature of Soviet policymaking; the fact that Soviet declaratory statements are carefully managed to obscure signs of internal discord on policy issues; the tiresome monotony of a homogenized "party line" in the Kremlin's propaganda utterances; and the frequent willingness of even informed commentators to overgeneralize for political, pedagogical, or other reasons so as to render a particular development more understandable to the "uninitiated." Instances of this last tendency have been especially evident in the readiness of some to construe the deployment of specific Soviet weapons, discrete Soviet actions (such as apparent arms control violations), and other behavior as "evidence" confirming larger, usually ominous, and apparently unified Soviet intentions rather than as a manifestation of perfectly normal organizational processes, pathological or otherwise.

Yet if there is such a thing as a monolithic Soviet political-military entity, to paraphrase William Kaufmann, nobody seems to have found

its telephone number.[18] Various components of the Soviet defense bureaucracy, and even communities *within* a particular institution, may view similar matters quite differently. Each branch of the Soviet military will naturally ascribe special importance to its own operational problems and downplay the importance of trends affecting other services. For example, the Soviet Air Force commander will be more interested in U.S. air-to-air missile progress than he will be in our attack submarine choices. By the same token, political and military authorities will not always see eye to eye on many issues.

This points up one of the most important aspects of SDI as it bears on future Soviet conduct. Regardless of how gravely the Soviets (or particular Soviet audiences) view SDI, how well the United States may be progressing in its SDI research, or how feasible or affordable Soviet experts may deem their various counter-SDI options, *SDI has implications for virtually every special interest community in the Soviet political-military establishment.* A good understanding of the Soviet defense bureaucracy will thus be essential to any forecast of Soviet SDI response options that pretends to be grounded in the realities of Soviet style rather than merely reflecting unconstrained engineering or "net assessment" imagination.

In this regard, consider SDI in light of other recent U.S. defense "initiatives," such as the pursuit of new conventional technologies for deep attack in Europe, the 600-ship Navy, strategic mobility enhancements, and so on. Each of these latter developments undoubtedly alerted some parts of the Soviet military but evoked only passing interest on the part of others. For example, the SRF would probably be indifferent to the increase in U.S. deployable fleet size from 500 to 600 ships, since the only significant American naval threat to the SRF (*Ohio*-class SSBNs carrying the Trident D5 SLBM) would remain constant in any case. Similarly, U.S. conventional force improvements will not be of equal concern to every branch of the Soviet Army or Air Force.

In contrast, a fully deployed SDI would affect nearly every undertaking of every Soviet service. For example, forces earmarked against the United States and its allies will be influenced, at least indirectly, by the implications of SDI for extended deterrence and escalation control. Similarly, major progress in SDI could dramatically reshape the current mix of Soviet military procurement, R&D, and operational expenditure. Civilians would be affected no less than the military. Any Soviet scheme to offset or emulate SDI could divert much talent,

[18]See William W. Kaufmann's testimony in *The Military Budget and National Economic Priorities*, U.S. Congress, Joint Economic Committee, 1969.

floorspace, and funding away from other important R&D enterprises. And the political implications of SDI for Soviet leaders concerned with broader matters, such as weakening American ties with friends and allies, are self-evident.

Accordingly, in developing any catalogue of future Soviet alternatives with regard to SDI, it will be essential to consider the specific institutions and individuals who might figure in some aggregate "response to Star Wars" roster. Such a detailed review is beyond the scope of this study. Nevertheless, we can suggest several communities as being especially important for close monitoring by any effort to anticipate Soviet reactions to any given SDI architecture. First will be the pertinent top-level leadership officials. These people will be mainly concerned with the political and strategic ramifications of SDI and will be preoccupied with near-term (and often immediate) problems and perspectives. Next will be the various design bureaus and scientific-technical organizations in the most critical advanced technology areas. These institutions are no more immune to internal carping over investment priorities than their American counterparts. Portions of the Soviet military concerned directly with strategic defense trends will warrant close attention as well, along with those parts less directly involved with strategic defenses, yet whose interests nevertheless stand to be affected by developments that could emanate from major defensive deployments on either side. Finally, it will be important to watch all other branches of the Soviet military whose plans, operating routines, or force structure depend to any degree on the perceived role of nuclear weapons in deterring or carrying out a conventional theater campaign.

An institution with special stakes in any Soviet response to SDI will be the Strategic Rocket Forces, whose weapons stand to be most directly threatened by the prospect of an American space-based BMD. The SRF has, over the years, acquired the reputation of being an established "heavy" in Soviet political-military circles, as well as an organization largely immune to public displays of incompetence of the sort that have recently come to afflict the Soviet air defense establishment. It will naturally feel strong compulsions to vouchsafe the continued relevance of its ICBMs through warhead proliferation or other offsetting measures before giving in to alternatives to SDI that would redound to the benefit of other Soviet service branches.

Beyond that, any consideration of alternative counters to SDI will almost surely find itself caught up in the larger internal debate over the relative weight to be ascribed to nuclear and nonnuclear forces in Soviet strategy. As just one indicator of such resource apportionment conflicts to come, the fact that Marshal Ogarkov remained so

uncharacteristically silent, at least in public, regarding SDI during his last year and a half as Chief of the General Staff spoke powerfully not only of his commitment to a Soviet defense policy emphasizing conventional arms, but also of his evident disinclination to help "legitimize" SDI as an excuse for precisely the sort of SRF programs over which he had long expressed serious reservations. Ogarkov's dismissal in September 1984 for articulating that policy view with excessive zeal during a touchy time of leadership transition might be viewed, in hindsight, as a net gain for the SRF, at least as far as the question of countering SDI may be concerned. Yet the internal debate over this issue within the Soviet armed forces is far from over, and any Soviet decision to begin a serious programmatic response to SDI will be bound to complicate that debate even further.[19]

To be sure, the presence of a strong General Staff organization able to impose central direction on Soviet weapons acquisition will most likely place limits on the tugging and hauling over programs and budgets among these groupings that has long characterized interservice rivalries in Western countries, the United States not excluded. Unlike most Western military establishments, the Soviet armed forces are organized under a system of powerful top-down supervision, in which centralization of functions in all arenas (air, sea, land, and space) is a standard operating practice. In this system, the main concern is less over which service predominates in any given mission area than over whether the mission gets satisfactorily performed.

The same can be said for the Soviet defense community as a whole, given the pervasive discipline generally imposed on Soviet military programs by such oversight bodies as the Military-Industrial Commission (VPK) and the Defense Council. Yet despite these regulating mechanisms, we can anticipate contention between, for example, the Soviet air defense establishment and the SRF (along with the SLBM component of the Soviet Navy) over the issue of whether it would be more advisable to emulate or negate SDI. The Soviet Air Force can also be expected to weigh in with its own parochial arguments for circumventing SDI by means of bombers and cruise missiles.

Even with regard to specific counter-SDI options, there will be competition within and among the various concerned service arms and R&D entities as they vie to design and produce the equipment of choice for maintaining Soviet offensive force penetrativity. Here as well, the leadership will probably succeed in stifling the more disruptive manifestations of bureaucratic infighting so as to minimize the

[19]For a good background discussion on this interconnected set of issues, see Jeremy Azrael, *The Soviet Civilian Leadership and the Military High Command, 1976-1986*, The RAND Corporation, R-3521-AF, June 1987.

institutional turmoil that will inevitably be generated by the need to accommodate SDI. Yet notwithstanding the moderating influence of the General Staff and other high-level management entities, it is still likely that those measures ultimately selected will heavily reflect the clout of the various Soviet institutions with the greatest interests at stake.

SOVIET DOCTRINAL PREDISPOSITIONS

Soviet military doctrine promises to influence Moscow's response to SDI not only by shaping the operational preferences of the High Command, but also by coloring the way the Soviets read our own motivations for pursuing SDI. To take the latter case first, it is characteristic of their political style for the Soviets to project their own worst impulses onto their adversaries as a technique for legitimizing their behavior. Given their natural tendency to harbor the darkest assumptions about their enemies' intentions, they will most likely feel strong compulsions to interpret American developments through their own doctrinal filter.

It is not unreasonable, therefore, to suppose that *whatever* rationale the President or any other U.S. official might attach to SDI, the Soviets will be inclined to view it just as they have viewed their *own* homeland defense efforts over the past three decades, namely, as an adjunct of a broader denial strategy aimed at underwriting national survival in the event of nuclear war. Furthermore, as we pointed out above, there is ample precedent in the history of American strategic defensive involvement to reinforce such a Soviet assessment. Although much of the Kremlin's rhetoric against SDI in this regard has been unabashed propaganda, there is every likelihood that it reflects a strong underlying conviction as well. After all, a similar motivation has driven the Soviet Union's own efforts in BMD, both before and since the signing of the ABM Treaty. Why, then, a Soviet planner might ask, should the Americans act any differently? Insofar as this interpretation has merit, it suggests that Moscow will meet SDI with all determination appropriate to countering a perceived U.S. effort to acquire a unilateral strategic advantage, whatever the avowed purpose of the American program may be. In this regard, one Soviet defense commentator openly bridled at what he called "this patronizing atti-

tude that the U.S. President need only to educate us about the virtue of his space program. There is no conceptual gap here."[20]

As for the connection between Soviet military doctrine and future Soviet responses to SDI, the point that matters most here concerns the prospect of the Soviet Union's acceding to any agreement (whether through negotiation or tacitly) that seeks to replace the current nuclear standoff with a new relationship dominated by defenses on both sides. Quite apart from the fact that the Soviet Union has routinely shown nothing but contempt for the idea of submitting its security arrangements to joint "legislation" by the United States, any such cooperative venture seems all but ruled out simply because of Moscow's apparent preference for making the best of its *existing* military doctrine.

It has been suggested by some that the Reagan administration's desired transition to a defense-dominant world should be rendered that much easier by the "natural" preeminence of the home defense mission in Soviet military thought. Unfortunately, this expectation reflects a fundamental misreading of the role of strategic defense in Soviet military planning. Although Soviet military theory has long placed great weight on strategic defense, far more than has been the case with American military policy, that emphasis has typically occurred within the context of a *continued parallel stress on the indispensability of overwhelming offensive forces.*

An early illustration of this Soviet tendency was provided around the time of the pre-SALT I exploratory discussions on an ABM freeze, when a Soviet military spokesman voiced a strong plea for continued Soviet offensive force modernization. This individual began by observing that "weapons and military-technical equipment . . . affect the methods and forms of conflict not immediately, but only after they have been accumulated on an adequately large scale." He then highlighted the continuing dialectic between offense and defense as "the axle around which the development of military affairs turns." Finally, he stressed the offensive as the only way to "achieve the routing of the enemy and establish victory" in case of war.[21] A similar view was expressed more recently in Marshal Ogarkov's injunction that although Soviet "strategic doctrine has a strictly defensive orientation, it also envisages, in the event of an attack by an aggressor . . . resolute actions by the Soviet armed forces, which have full mastery of the art

[20]Quoted in Thom Shanker, "Behind Soviet Propaganda Is Fear of Star Wars," *Chicago Tribune*, October 27, 1985.

[21]Colonel S. Krupnov, "On the Development of the Methods and Forms of Armed Conflict," *Krasnaia zvezda*, January 7, 1966.

of waging not only defensive, but also modern offensive operations on land, in the air, and at sea."[22]

In sum, whatever credence one may ascribe to Moscow's putative doctrinal tradition of "defense-mindedness," the offensive remains the linchpin of Soviet strategy, and it is only through well-endowed offensive forces that Soviet planners contemplate surviving any war they may have to fight in the wake of a catastrophic deterrence failure. In this outlook, active defenses are merely seen as a backstop for what remains essentially a counterforce-oriented strategy. They certainly are not seen as a *substitute* for offensive forces or as suitable guarantors of Soviet security in and of themselves.

It is not, of course, inconceivable that out of a common-sense desire to avoid worse alternatives, the Soviets might eventually recognize the wisdom of joining in a cooperative effort with the United States to alter the current foundations of nuclear deterrence. After all, they found it convenient enough to sign the ABM Treaty when doing so served their perceived security interests, notwithstanding the powerful (and persistent) injunctions of their military doctrine, which tended to point the other way. Yet in all likelihood, any serious Soviet willingness to participate in a joint transition to a defense-dominated strategic world will require their acceptance of a security paradigm very different from the one that currently undergirds their force modernization. We could wait forever for Moscow to embrace the logic of defensive emphasis within the context of existing Soviet doctrinal proclivities.[23]

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[22]Marshal N. Ogarkov, "Guarding Peaceful Labor," *Kommunist*, No. 2, 1981, p. 86. This sentiment was also apparent in the following invocation of Lenin by a prominent Soviet military theoretician: "To tell us that we must wage only a defensive war when the knife continues to be raised above us . . . is to repeat old phrases of petty bourgeois pacifism which long ago lost their meaning." Colonel General N. Lomov and Colonel S. Alferov, "On the Question of Soviet Military Doctrine," *Voenno-istoricheskii zhurnal*, No. 7, 1978, p. 25.

[23]As for the oft-expressed willingness of the Reagan administration to bestow upon the Soviets the fruits of SDI as an inducement for their participation in a cooperative transition, the Kremlin's stance was summarized in this reply by Gorbachev to the President at Reykjavik: "I cannot take this idea of yours seriously. . . . You don't want to share with us even equipment for dairy plants at this point, and now you're promising us that you're going to share results of SDI research?" "Excerpts of Speech by Gorbachev About Iceland Meeting," *New York Times*, October 15, 1986.

THE MOUNTING DEFENSE BURDEN ON THE SOVIET ECONOMY

Perhaps the single most important factor that will determine Moscow's response to SDI, after all allowances are made for technical wherewithal and the inevitable disputes that will arise over allocation priorities, involves the total availability of fiscal resources the Kremlin will be able to marshal against the problem. Among the many truisms that abound with regard to the Soviet Union today, one of the most common is that the Party leadership—after two decades of sustained force modernization—is finally having to confront the looming presence of real limits to further military growth. Economic reform is not just one of the most urgent priorities facing the Gorbachev regime; it is imperative if the Soviet Union is to remain a competitive global power in the 21st century. Although Soviet military expenditure has risen steadily each year since the beginnings of the buildup in 1965, there has been a mounting decline in the *rate* of military investment—more or less in tandem with the general decline in the rate of annual Soviet economic growth (now at around 2 percent, down from 6 percent in the 1950s and 4 percent just a decade or so ago).[24]

For this reason, SDI would have come as bad news to the Soviet leaders in any event. But there are even further problems posed by competing demands for Soviet resources *within* the military sector. Before SDI, the Defense Ministry was already grappling with the thorny issue of how to fund a number of increasingly pressing mission needs that promised to stress the Soviet defense budget mightily. For one thing, there was the growing hard-target challenge to Soviet ICBMs posed by MX and Trident D5. Beyond that, the already permeable Soviet air defense net was becoming even more penetrable with the specter of cruise missiles, the B-1B, and the Advanced Technology Bomber. Finally, Moscow's traditional long suit in Europe—its overwhelming numerical dominance in ground forces—was increasingly coming to feel heat from a variety of nested U.S. emerging-technology counters in the conventional deep-attack area, along with associated command, control, and data fusion systems promising to convert this sophisticated technology into an effective denial of Moscow's long-standing conventional force advantages.[25] The costs of further naval

[24]However, this defense slowdown has occurred simultaneously with an overall decline in Soviet productivity growth, with the net effect that defense spending has remained a constant 13-14 percent of GNP since 1970. See *Estimated Soviet Spending: Trends and Prospects*, Central Intelligence Agency, SR 78-10121, June 1978.

[25]Evidently it was concern over this last trend that led Marshal Ogarkov to speak out loudly enough on the subject to cause him, at least in part, to lose his job as Chief of the General Staff. See William J. Eaton, "Rift Hinted in Removal of Soviet Marshal," *Los Angeles Times*, September 8, 1984.

expansion (which the Kremlin has since apparently decided to curb), a growing manpower crunch, third-world military aid, and the drain of operations in Afghanistan no doubt added up as well. It was on top of these and other *preexisting* "here and now" tradeoff dilemmas that the Kremlin was presented with SDI and its implied threat to open up a whole new dimension of superpower arms competition.

This situation would, by itself, constitute more than ample grounds for Soviet pessimism, but the problem is worse yet. Whatever course SDI ultimately takes, there is a strong likelihood that Moscow's response will occur in a deteriorating economic environment. Since 1976, there has been a pronounced decline in productivity growth as the Soviet economy has found itself simultaneously confronted with slackening capital investment, unanticipated shortages in energy and raw materials, and transportation bottlenecks.[25] One of the key problems now facing Soviet planners is the need to shift their economy from an extensive to an intensive growth footing by supplanting simple additions of labor and capital with more effective leveraging of modern technology.

In an effort to deal with this issue, Gorbachev proposed at the April 1985 Communist Party plenum that greater attention be devoted to the machine-building sector, particularly that part concerned with electronic engineering, machine tools, and computers and instruments. A problem confronting this ambition, however, is that these investment items compete directly with the production of modern surface vessels, nuclear submarines, and other high-technology strategic systems. As a result, Gorbachev's effort to revitalize the economy by stimulating intensive growth through the application of high technology may be severely strained by the competition between that goal and the existing high-technology Soviet defense effort.

Added to this is the fact that the Soviet economy is less efficient than that of the United States, especially at the advanced technology end where strategic and space systems come into play. As the level of technological sophistication increases, a dollar's worth of Soviet defense goods tends to cost a greater relative amount of rubles. Using

[26]These and other problems have combined to yield an official U.S. government predicted Soviet GNP growth rate of some 1.5 to 2.5 percent for the remainder of the 1980s (although that prediction was ventured before the announcement of Gorbachev's economic modernization campaign, which has the prospect—at least in principle—of yielding somewhat improved performance, depending on the extent to which it evolves beyond political rhetoric). See "Statement by Robert Gates, Deputy Director for Intelligence, Central Intelligence Agency, on the Allocation of Resources in the Soviet Union and China, 1984" before the Subcommittee on International Trade, Finance, and Security Economics of the Joint Economic Committee, U.S. Congress, November 21, 1984, pp. 2 and 35.

data based on 1970 rubles and 1979 dollars in the principal military investment categories (R&D, procurement, and operations), the Central Intelligence Agency has estimated that Soviet military manpower enjoys the lowest ruble-dollar ratio of .17, whereas RDT&E and procurement show a ratio of .45, with space topping out at .50.[27] This means that even though the Soviet Union maintains an active and successful space program, it does so at a high opportunity cost compared with investment in other sectors.

Some have cited this evidence of Soviet economic duress to argue that now may be a good time to try to "spend them into the ground" by means of SDI. Unfortunately, history has not been kind to the United States with regard to such efforts. Unlike most of their Western counterparts, the Soviet leaders do not consider defense spending to be an unavoidable form of social overhead. On the contrary, they enjoy the comparative luxury of not having to regard such spending as a "burden" until and unless they define it as such. The ability of the regime to discipline its people to accept hardship requires no documentation. Although he was plainly exaggerating for effect, the chief editor of *Pravda*, Viktor Afanasyev, was not far off the mark when he asserted to an Austrian reporter in early 1985 that "if necessary we will eat only once a day" to help field an effective counter to SDI.[28]

Nevertheless, the prospect of having to react to a U.S. space-based ABM confronts the Soviets with some uncongenial policy choices. Recent RAND research based on the dollar-ruble ratios noted above has shown that a Soviet offsetting response to a notional SDI system costing some $500 billion and incorporating 34,000 space-based rocket-propelled interceptors (RPIs) could force the Soviets to spend upward of 23 billion rubles over two decades to retain any significant offensive force penetrativity in the face of this defense.[29] Even then, a Soviet retaliatory strike might only be capable of destroying a fraction of the intended target value, with the result that the SDI system would still enhance U.S. extended deterrence. Furthermore, although this estimated cost of some 1.2 billion rubles a year would constitute only a small percentage of overall defense spending by the Soviets, it would

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[27]These ratios have been derived from data presented in *Soviet and U.S. Defense Activities, 1970-79: A Dollar Cost Comparison*, Central Intelligence Agency, SR 80-10005, January 1980; *Estimated Soviet Defense Spending in Rubles, 1970-75*, Central Intelligence Agency, SR 76-10121U, May 1976; and *Estimated Soviet Defense Spending: Trends and Prospects*, Central Intelligence Agency, SR 78-10121, June 1978.

[28]Interview in *Die Presse* (Vienna), January 29, 1985.

[29]The analysis and examples presented here are drawn from an unpublished study by Gregory G. Hildebrandt of The RAND Corporation.

nearly equal the expenditure that would be required to fund a critical nonnuclear program, such as upgrading the Soviet Air Force's fighter inventory with the MiG-29. For this reason, all the more so considering their recent embrace of a conventional-emphasis strategy in the NATO-Warsaw Pact arena, it is improbable that the Soviets will undertake any effort to offset SDI at the expense of a well-defined general-purpose force program. Instead, investment or consumption in the economy at large will more likely be selected to absorb the loss.

In the event the Soviets chose to counter SDI with an *emulative* response, the same RAND analysis has indicated that the cost burden would be greatly increased, ranging from 200 to 400 billion rubles (assuming a dollar-ruble ratio of .50 for space-related activities) depending on the efficiency of the effort. Not only that, such a response would compete directly with Gorbachev's economic modernization program because of its great demand on Soviet high-technology resources. This could prove self-defeating for the Kremlin if it turned out that successful economic revitalization was a precondition for any effective emulation of SDI.

Accordingly, the Soviets are confronted with multiple dilemmas. If Gorbachev's campaign to improve the economy fails yet Moscow still endeavors to maintain high investment growth, the Soviets will experience a decline in consumption even if their defense spending continues along the lines of the past decade and Moscow decides *not* to emulate SDI. In the more exacting case of a Soviet emulation response coupled with unsuccessful economic reform, the result will almost surely be a near-term decline in consumption.

None of this says a word about the extent to which these different outcomes would be felt as a "burden" by the Soviet leadership, however they might influence the daily livelihood of the rank and file. But it does offer a basis for at least some rough-order conclusions about the relative attractiveness of the various SDI responses available to the Soviets. Countering SDI merely by increased warhead fractionation can probably be done with a ruble expenditure that constitutes only a small portion of overall Soviet defense spending. Such a response might or might not buy the Soviets much with regard to their broader deterrence needs, but it would certainly contrast sharply with the far greater increment in cost that would be imposed by any attempt to pursue an emulation response. For this reason, it seems likely that at least in the near term, the Soviets will *not* emulate SDI until they first modernize their economic and technological base to a degree adequate to support such an effort.

The one exception to this forecast has to do with the possibility, however remote, that the Soviets may have evolved a base of R&D in

directed energy more promising than that generally ascribed to them by the Western technical community. As noted above, Soviet research in directed energy began in the 1950s and rose to an appreciable level of effort well before analogous programs got under way in the various American national laboratories. Indeed, directed energy stands out as perhaps the sole major BMD-related technology area in which the United States has consistently been emulating *Soviet* developments. Examples in point include, among other applications, key components of the neutron particle beam, the radial-line electron accelerator, the gyrotron microwave oscillator, and laser channel stabilization of electron beams. Considering that the Soviets formed and refined many of their ideas on this subject long before the advent of SDI, this suggests as an outside possibility that they may have developed their own unique, and perhaps simpler, concepts of BMD that are not reflected in their public statements or observable RDT&E activities.

Granted, there remains considerable doubt in the West regarding the technical and operational feasibility of directed energy weapons, whatever interim successes the Soviets may have registered. Moreover, any Soviet development of a BMD comparable to that envisaged by SDI is ruled out, at least for the near future, by the economic and technological constraints described above. Yet the fact remains that we know little about Soviet progress in this area other than that they have been working long and hard at it. Accordingly, however low the probability may be, it is not inconceivable that their early, active, and enduring interest in directed energy has given them an approach to BMD that would render them at least somewhat independent of U.S. initiatives in this regard.[30]

Not surprisingly, the Soviets have reacted with great sensitivity to Western intimations that they lack the technical and economic wherewithal to hold their own in an SDI competition. Indeed, much of Moscow's indignation over such allegations can be directly traced to this visceral discomfiture over being portrayed as anything less than an "equal" to the United States. Nevertheless, as the analysis above indicates, Moscow's existing economic and technical constraints have been greatly aggravated by SDI. Just how acutely the Soviets feel these constraints and may be disposed to entertain offensive force reductions to ameliorate them, however, are questions that will have to await better evidence about the kinds of SDI deployments they might have to counter, barring an arms control agreement that would render such counters unnecessary.

[30]We are grateful to our RAND colleague Simon Kassel for sharing this cautionary note with us.

In a reflection on the hard choices that the resource issue has presented before the Politburo, Robert Conquest has ventured the appealing proposition that the Soviets may find themselves in a truly impossible situation should SDI lead to promising technologies and result in a large-scale deployment program. In such an event, he has suggested, they might feel driven to accept a temporary pause in the strategic competition while, in a characteristically Leninist quest for a "breathing spell," they redirected their energies toward some of the increasingly pressing problems of their own economy, domestic polity, and empire. Yet however attractive this prospect may appear to be from a self-interested American point of view, it is one the Soviet leaders will exert every effort to avoid.[31] Accordingly, the United States should not place great hopes on it.

On the other hand, Moscow's agitation seems sufficiently rooted in real concerns over the resource question that the United States can hardly go wrong by continuing to play its SDI card closely, pending a more confident assessment of just how much the Soviets might be willing to pay to head it off. In combination with other trends in U.S. nuclear and general-purpose force modernization, SDI has placed the United States in perhaps a stronger bargaining position relative to the Soviet Union than at any time since the Kennedy-McNamara buildup of the early 1960s. The challenge posed for the Soviets by SDI may also have an important political dimension for Gorbachev personally, which could markedly bolster his felt need to avoid a costly BMD competition. In an interesting reflection on this possibility, former CIA Director William Colby has suggested that Gorbachev's future as General Secretary of the Communist Party could be riding heavily on his ability to get the stagnant Soviet economy moving again by freeing up financial assets now committed to the strategic competition. "If he's not able to do it," noted Colby, "he's going to be replaced by somebody else."[32]

Obviously one can never be sure about prognoses of this sort. Nevertheless, in light of the compound dilemmas that SDI has put before the Soviet leadership, an important challenge facing the U.S.

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[31]Conquest recognizes this in pointing out that any such admission of defeat by the Soviets would require a U.S. arms deployment policy "of a consistency and clarity which it is perhaps unrealistic to expect." Indeed, he notes, "the whole of Soviet foreign policy vis-à-vis the West has, since 1965, been based on working to ensure that the 'imperialists' do not in fact deploy their economic and technological superiority." Robert Conquest, "The Soviet Succession Problem and Foreign and Arms Policies," paper prepared for a conference on "Domestic Influences on Soviet Foreign Policy," University of California, Los Angeles, October 11, 1985, p. 17.

[32]Quoted in Walter Andrews, "Gorbachev Apparently Needs a Nuclear Accord," *Washington Times*, July 10, 1986.

government is to develop a measured strategy that brings SDI into parallel with our diplomacy toward the Soviet Union so that we might elicit the greatest possible *political* leverage from it, even as we continue to press for a technical validation of the multiple concepts it is exploring.[33]

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[33]A good case for this argument, which views SDI primarily as a "strategic and political instrument" whose greatest value lies in its ability "to gain a measure of control over the behavior and planning of the USSR," is offered in Roger P. Main, "Moscow and the Strategic Defense Initiative," *Soviet Analyst*, March 20, 1985. See also James R. Schlesinger, "Rhetoric and Realities in the Star Wars Debate," *International Security*, Summer 1985, pp. 3–12.

VIII. BOUNDING THE SCOPE OF MOSCOW'S RESPONSE OPTIONS

As the preceding section has indicated, the determinants that will affect the Kremlin's reaction to SDI include enough uncertainties and uncontrollable factors on *both* sides that identification of most likely scenarios is bound to be unsatisfying from either a policymaker's or an analyst's point of view. Assigning weights to the probability of different outcomes would be an even greater exercise in frustration. Many of the factors that might reasonably be said to "lead to" one or another Soviet choice—including concrete U.S. actions not now contemplated, possible technology developments about which scientists can still only speculate, and a host of other political and economic developments—are inherently intractable when it comes to systematic analysis. Finally, there are conceivable Soviet responses that would concern multiple national requirements. To estimate the specific form these might assume, let alone predict their likelihood, would require not just a forecast about Moscow's reaction to a definitive SDI of whatever type, but also an assessment of Soviet reactions to related problems, such as the need to revitalize a sagging economy and the question of how far to go in tying the future of Soviet security to arms control.

A parallel issue concerns the time horizon of the response in question. Since President Reagan first announced SDI, debate within the American defense community has been wide open regarding what it might entail and when various developments will see the light of day. Without a basic chronological frame of reference, matters of development lead times and overlapping, concurrent, and sequential responses cannot be considered even in principle. Even when it comes to a specific SDI-related technology, such as high-energy chemical lasers intended to destroy missile boosters, forecasts about likely availability range from the "near term" (five or ten years) to the distant future (sometime well into the 21st century). As if this did not inject enough confusion, alternative SDI concepts and counters are often randomly matched. It is not uncommon to read, for instance, of the expected performance of a laser type which most scientists agree will not be available for decades against Soviet ICBM boosters that are deployed

today.[1] Given the inherent dynamism of offense-defense interactions and the matter of lead times, which will be especially crucial in anything as technologically *avant garde* as SDI, this kind of analysis is at best unhelpful and at worst risks being dangerously misleading.[2]

In short, one need not be much of an expert to recognize that no prediction, or even generic portfolio of alternatives, should be vested with very much more authority or plausibility than another. Indeed, the estimator desirous of peering very far beyond the near term, which, in the present setting, can almost be defined as having a maximum span of months, could be accused of the common fallacy of looking for one's keys under the lamppost because that is where the light is best.[3] For any rationalization of future Soviet behavior, however intuitively reasonable, a skeptic can always suggest an equally plausible range of what doctors call "differential diagnoses." In almost every case, then, a forecast of specific Soviet SDI counters will be at best "interesting" but not very substantive. At worst, it could actually be harmful, since a hypothesized Soviet response adopted for SDI planning might divert us from other possibilities that also warrant careful attention.

We can ease this dilemma, however, if we evaluate possible Soviet responses at either very aggregated or very refined levels of resolution. To take the latter case first, if we stipulate a physically determined threat, such as a form of radiation of a certain wavelength and intensity, the laws of nature can provide us with insight into the means available to the Soviets for negating its effects. At the other end of the spectrum, we can consider Soviet response patterns that are sufficiently broad-brush in nature that the unpredictable details of the

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[1]Consider, for example, the statement that to shield a Soviet SS-18 ICBM from an American space-based laser would require an inch-thick coating of protective material, which would deprive the missile of any useful operational payload. That may be true, but the SS-18 will have long since been retired from the SRF's inventory by the time any such U.S. BMD system sees the light of day. For this and other cases in point, see Martin Sieff, "Soviets Bluffing, SDI's Backers Claim," *Washington Times*, September 4, 1986.

[2]It is instructive to recall in this regard that the 1972 ABM Treaty, signed at a time when *no* major technical or political disruptions were deemed likely and when well-understood hardware was on the brink of deployment, was nevertheless written so as to allow for a review by both parties in five years.

[3]To give just one illustration, the SDI program has at times literally changed from day to day. The Defense Department's initial FY1988 budget request of $5.4 billion would have vaulted a program that had not even *existed* during planning for the FY1984 budget to the rank of the largest individual Defense Department line item. It now appears that Congress will trim this item significantly in its FY1988 budget law. It is hard to imagine what a comparable cut in a more traditional military spending program would mean, except to say that it would entail a catastrophe. Yet such are the fluctuations of the SDI planning environment just within the American government, let alone between the United States and the Soviet Union.

scenario do not matter. Restricting our focus to this level of resolution may provide a better basis for anticipating Soviet reactions to an SDI deployment of *whatever* sort.

In the discussion that follows, we present an overview of Soviet response options pitched at this second level of analysis. The discussion excludes the sort of political, diplomatic, and propaganda ploys discussed above and restricts itself to programmatic alternatives that assume some variant of a deployed (or well advanced) SDI. No effort is made to assign probabilities to any particular Soviet option. Nor are estimates hazarded regarding the risks posed to the United States by any particular line of Soviet SDI countermeasures. Rather, the survey of options etched out below merely offers a heuristic backdrop against which more detailed forecasting might be done by interested agencies within the SDI research community.

Two broad types of response are considered: (a) primarily military or technological steps entailing specific operational, technical, or tactical measures, and (b) "strategic" steps that seek more fundamental changes in the East-West security relationship. The first category offers a sample of possible Soviet efforts to restore the military balance to a condition that might have prevailed in the absence of SDI, to consolidate some side gain, or perhaps to take advantage of SDI as an "excuse" to pursue some military goal that might have been sought in any event. In this category, no reconsideration of the traditional missions of nuclear forces is at issue. The question merely concerns the preservation of a given Soviet capability in the face of new American defensive enterprises.

The second category embraces possible Soviet actions that acknowledge a substantial change in the overall balance. Such actions would aim to adjust operational concepts, other military balances, or even the strategic context as a whole so that a range of abiding Soviet policy goals could still be pursued with some measure of predictability. In this case, to give just one example, SDI might mean that nuclear forces would decline in their relative importance in helping the Soviets pursue their worldwide political and military objectives, thereby calling for Soviet actions to compensate, perhaps in some other military sphere, for the reduced importance of nuclear weapons.

Of course, like most policy undertakings, Soviet military activities of the sort envisioned here cannot easily be classified as specific responses to specific stimuli. No military concept, program, or option can be divorced from the larger political matrix from which it emanates. Likewise, there is no ready technique for dealing with the roles played by faulty perceptions, incorrect predictions of future developments, concealed motives, delays in action, third-party influences, erroneous

decision implementation, pure chance, and similar factors. All the same, we have to bound the possible steps that might be taken by the two sides, however problematic crystal-ball-gazing may be when it comes to specific Soviet choices. Moscow's SDI responses will naturally depend on the nature of both sides' offensive and defensive deployments.[4] They will also vary with the scenario adopted for planning, the behavior of other players, and a host of related unpredictables. For these reasons, the following discussion addresses only *generic* categories of Soviet response.[5]

PRIMARILY MILITARY-TECHNOLOGICAL MEASURES

Among their programmatic options, the Soviets will certainly explore a range of military, technical, and operational means either to undermine an SDI system or to circumvent its ability to perform its mission. The following discussion examines four classes of possible reaction.

Actively Hindering U.S. Strategic Defenses

Perhaps the most straightforward Soviet countermeasure would be to attempt to prevent full deployment of SDI by active interference or disruption. A system along the lines suggested in the President's March 1983 speech would presumably be able to defend itself to a considerable degree. Accordingly, the Soviets might seek to exploit American vulnerabilities during the critical transition period in which any SDI constellation would still suffer major gaps, especially in a self-defense capacity.[6] Assaults against partially deployed defenses could be conducted as a part of a Soviet preventive campaign, as might clandestine attacks against U.S. space launch facilities. Inasmuch as early SDI deployments might be partially experimental in nature, it might suffice for the Soviets to confound our ability to determine the system's effectiveness.

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[4]For example, if combat forces on the ground within national boundaries are thought to enjoy some measure of sanctuary status yet forces in space or at sea are not, either side's ability to neutralize the adversary's defenses will depend centrally on the specific character of fielded forces.

[5]For a fuller treatment of Soviet response options that amplifies on the analysis in this section, see Kevin N. Lewis, *Possible Soviet Responses to the Strategic Defense Initiative: A Functionally Organized Taxonomy*, The RAND Corporation, N-2478-AF, July 1986.

[6]Even the most optimistic forecasts of SDI's ultimate performance admit that deployment of a comprehensive space-based BMD will take substantial time and will involve the sequential fielding not only of different defense *layers*, but also perhaps of different defense *generations*.

Because the control infrastructure for a major SDI network could be large and technologically complex, direct attacks on key components could be carried out well into the acquisition phase, leaving the United States with little to show for a substantial investment. A notional model for such action might be the Israeli air attack on the Iraqi Ossirak nuclear reactor in 1981. Given the inherent fragility of space operations, at least today, successful Soviet attacks might not have to cross what are now considered critical escalation thresholds. Special-forces attacks against antennas, radars, propellant facilities, assembly areas, and so on could inflict devastating damage and might leave it hard for the United States to reciprocate in kind.[7] Of course, any overt attack of this sort would be extremely provocative, if not an outright act of war. However, clandestine measures, even if identifiable by the U.S. government, might not provide sufficiently apparent justifications to domestic audiences to support decisive reprisals.

Going even further, the Soviets might in some circumstances be emboldened to suppress SDI satellites and related components directly. However advanced such a network might be, the Soviets could choose to neutralize parts of it much in the way that Soviet air defenses would be suppressed today to allow penetration of SAC bombers and cruise missiles. Direct suppression could take many forms, depending on the nature of the offenses being suppressed. For example, if an orbiting SDI constellation consisted of satellites with limited weapons loads, suppression tactics could be different than they might be against satellites whose lethal payloads might have greater persistence. Similarly, depending on Soviet aims and requirements, suppression strikes could follow different lines. If there was no urgent need for simultaneous attacks against many U.S. targets, the Soviets might be able to poke holes in at least one echelon of an American defensive constellation and exploit these as launch windows appeared from time to time.[8] The progress of other operations aimed against U.S. national-level

[7]A special variant of this option would entail Soviet action were the United States to appear on the verge of achieving effective defenses without a condition of mutual invulnerability. Such a circumstance is unlikely, given the much greater ease of dealing with defenses in advance and the inevitable delays that either side would encounter on the way to a good defense. Nevertheless, it bears noting that in Japan's deliberations to attack the United States at Pearl Harbor, those arguing for preemptive action pointed out that the superior American industrial base would ultimately make military defeat of the United States impossible and that prompt action offered the only conceivable path to victory.

[8]Thus, satellites in a space-based SDI network would be "on duty" above Soviet missile launch sites on land or at sea only for a short period. Throughout the remainder of their orbits, they would be less able to contribute to the main task of defending against a major missile attack. Were it possible for Moscow to disable a portion of an overhead SDI constellation, the Soviets would have at least the *option* of waiting until that seg-

command and control assets can also be expected to figure in Soviet tactical planning.

A related strategy might aim to disrupt SDI battle management, sensor, and control adjuncts. A key requirement of any SDI system, especially one with space-based components, is that it be capable of very rapid response. This reflects the need to cope with short burn-time missiles and early MIRV and countermeasure deployment. Also, the possible inclusion of nuclear explosives in some SDI components, the instantaneous attack potential of directed energy weapons and certain kinds of electronic countermeasures, and the inherent ASAT potential of some satellites will impose unprecedented stresses on command and control and warning systems. Some commentators have suggested that some predelegation in a nuclear-armed SDI system might be required.[9] Although this would be less prone to trigger automatic escalation than might occur in the case of offensive forces, it nevertheless dramatizes the need for prompt and decisive action involving substantial human intervention. For this reason, interference with the nervous system of a deployed SDI (such as destruction of ground terminals) could incapacitate key components. Increasing the number of layers of a defense and hardening key control and other facilities would make disruption more difficult, but total protection against such countermeasures will be very expensive and perhaps politically or militarily undesirable.

Short of direct interference, the Soviets could attempt to force a gradual degradation of SDI over time. Cost, reliability, personnel, and other factors often combine to rule out high levels of combat readiness over extended periods.[10] Some elements of an SDI system might degrade, predictably or otherwise, as a matter of course over time. For example, satellites will use up fuel needed for orbital station-keeping. Other elements would degrade under conditions of peaked readiness,

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ment of the network (if unreconstitute !) reappeared overhead, launching strikes in small packages through this gap in defensive coverage.

[9]For example, former French Minister of Defense Paul Quilès has noted that the need for rapid activation of a space-based BMD network implies "a completely automatic functioning and a release without human intervention, in contrast to the current situation in which responsible officials have thirty or more minutes to take a decision. This is a logic that has never been accepted by responsible politicians or public opinion; it amounts to withdrawing power from man in order to confide it to a machine." "L'avenir de notre concept de défense face aux progrès technologiques," *Défense Nationale*, January 1986, p. 15.

[10]In some cases, such as that of the U.S. ICBM force, portions of a military posture can be kept at high peacetime readiness indefinitely. At the other end of the spectrum are bombers and some kinds of civil defense. Readiness in these areas is maintained only at enormous cost. Even then, one can expect relative effectiveness to decay over time regardless of how much is invested.

perhaps in areas in which operator fatigue would be a significant factor. In some cases, degradation might be induced by measures short of direct attack, such as by repeated spoofing to exhaust the capability of some defenses. A precedent reflecting the potential of this kind of spoofing can be seen in the anxieties that dominated both sides during the July 1914 crises leading up to World War I. At that time, it was widely feared that mobilization occurring incompletely or too quickly (or requiring a standdown before a commitment to full-scale operations) might fatally hamstring the chances for the subsequent execution of coordinated and elaborate offensive plans that had been drawn up long before.[11]

Relatedly, many kinds of combat capability undergo changes in effectiveness at well-characterizable points during mobilization or increased alert. Careful manipulation of events might thus create transient periods of vulnerability that could be exploited in a number of ways. For example, to defeat a ground-based SDI system in such a manner, Soviet attacks might be launched in parcels small enough to force us to squander many potential kills. Defenses that relied on early commitment of single-shot weapons or on technical principles requiring early employment decisions could be particularly susceptible to such a tactic.

Less provocatively, the Soviets might try to disrupt or harass SDI-related tests, exercises, and crew training. Obviously, any emergency requiring the full-blown employment of a strategic defense network would demand a high level of operational performance. Yet it is hard to simulate the kinds of major Soviet attacks that might most severely tax an SDI system, especially a space-based BMD constellation. Aside from that, it might be desirable *not* to reveal some critical performance parameters of SDI, lest valuable capabilities be neutralized or emulated. Thus SDI portends some difficult training and evaluation problems that the Soviets can attempt to exploit by influencing the course of any deployment and system shakedown effort.

Finally, if driven to it, Moscow could try to sabotage SDI-related industry and test facilities. The series production of sophisticated and costly space vehicles has never been attempted. It is thus difficult to say beforehand whether an "assembly line" for SDI components can be opened or whether all systems will have to be hand-made. In either case, the delicacy of the production base, the need for extraordinary quality control, and the unlikely duplication of key industrial

[11]Probably the best treatment of this historical case in terms of its modern relevance is Herman Kahn, *On Thermonuclear War* (Princeton University Press, Princeton, New Jersey, 1961), pp. 350-375. See also Thomas C. Schelling, *Arms and Influence* (Yale University Press, New Haven, Connecticut, 1966), pp. 221ff.

capabilities will all render the SDI production infrastructure a fragile and lucrative target.

Emulation of U.S. Defensive Capabilities

As stated above, the Soviets have sunk tremendous resources into the development of their own homeland defenses. Where they have been unwilling to pursue some line of defensive force enhancement, they have generally been so disinclined out of fear of a competition with the United States that they could not win. This is a powerful explanation for Moscow's acquiescence in the ABM Treaty, and SDI's proponents have cited such fear as a valuable source of potential leverage for the United States. This view takes on special credence in light of the Soviet Union's continued insistence that SDI must be curtailed as the precondition for meaningful arms control progress in other areas. Yet once an SDI program began to show definite signs of progress toward production and deployment decisions, the Soviets might feel less inhibited and more inclined to pursue all avenues available to them, barred only by technological, economic, institutional, and "image" concerns.[12]

Leaving aside possible activities in such allied areas as antisubmarine warfare and air defense, any Soviet emulation of SDI would almost certainly feature a combination of space-based and ground-based interceptors. On the first count, Moscow's interest in the military uses of space and its apparent determination to match any U.S. exploitation of space for strategic defense would probably constitute adequate grounds by themselves to justify a responsive Soviet development of space-based defenses. Yet the forms any such Soviet system might assume could be quite different from those of its American counterpart. For one thing, space-based defenses would lie at the cutting edge of a competition in which U.S. technological and quality-control superiority would be most dramatically apparent. One might accordingly expect a Soviet space-based BMD effort to have a larger manned component than ours.

U.S. and Soviet ballistic threats to one another would not necessarily be symmetrical. The American ICBM force is not as fractionated as that of the Soviet Union, and our acquisition of a small ICBM with a single warhead could further reduce the relative importance to the Soviets of being able to kill ICBM boosters early during their flights. On the other hand, the American SLBM threat is highly

[12]An exception to this would be the highly unlikely event of a cooperative Soviet-American SDI deployment.

MIRVed. Trident D5 will have ICBM-like accuracy and range, although this threat will emanate from up to 20 deployed missile "fields" in diverse ocean areas rather than from a few ICBM farms spaced fairly close together within the continental United States. However, certain inflexibilities of nuclear ballistic-missile submarine (SSBN) operations could play to Moscow's advantage were the Soviets to field a comprehensive BMD of their own. For instance, SLBMs cannot now be launched simultaneously and would therefore be less able to saturate Soviet defenses than ICBMs. For that reason, American SLBM growth potential in response to a Soviet defensive challenge might be limited.[13]

Even more likely would be a determined Soviet pursuit of improved ground-based ABM defenses. Unlike the United States, which decommissioned its single BMD complex in North Dakota shortly after it became operational, the Soviets have maintained their Moscow system and continue to improve it.[14] Given this comparative advantage and Moscow's problems in matching the United States at the high end of the defensive technology game, along with the priority the USSR has traditionally assigned to surface-to-air missiles, it is reasonable to suppose that a ground-based ABM could be a major part of any unconstrained Soviet BMD scheme. Of course, Soviet designers would have to undertake some complex and costly countermeasures to offset certain ground-based ABM liabilities, particularly their vulnerability to suppression. They could accommodate this by proliferating missiles and, to the extent possible, building mobility and redundancy into their ground-based radar components. One might also expect the USSR to deploy an expanded stop-gap ground-based ABM *before* deploying a space-based system, rather than deploying the two simultaneously, as the United States is more likely to do. This probability is enhanced by Moscow's long-standing record of improving its defenses in an incremental, building-block fashion.

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[13]Unless the U.S. offensive posture changes radically in the next two or three decades, the Soviets will presumably pursue a kinetic-energy type of space defense system. The existence of BMD satellites on both sides will adversely affect SSBN operations in other ways as well. Because a necessary corollary to effective space-based BMD will be a full range of capabilities for instantly tracking missile plumes with a high degree of accuracy, the problem of partially "unloading" an SSBN would be aggravated.

[14]This probably has more to do with the threat posed to the USSR by third parties—Britain, France, and China—than with any uniquely American threat. See Kevin N. Lewis, *Ballistic Missile Defense, ICBM Modernization, and Small Strategic Attacks: Out of the Frying Pan?* The RAND Corporation, P-6902, March 1983, for additional discus-

By virtue of its Pershing II deployment, the United States has added a qualita-

new threat to the Soviet NCA. However, the Soviet decision to proceed with

nizing the Moscow ABM probably preceded the emergence of this threat.

Evasion of Selected SDI Components

In the event the United States appeared about to erect a militarily effective SDI, the Soviets would undoubtedly feel strong compulsions to neutralize the capacity of that defense to negate the Soviet strategic posture in conjunction with American offensive forces. Granted, a U.S. offensive force capable of a "splendid" first strike against Soviet retaliatory assets is unlikely, given the diversity and redundancy of delivery systems in the Soviet arsenal. Nevertheless, even the *thought* of a robust American offense coupled with a defense able to absorb what would probably be, at best, a ragged Soviet retaliation might suffice to deter Moscow from responding to a U.S. first strike because of the disparity of damage the USSR would incur from a subsequent, more punitive exchange. To that extent, an SDI umbrella that was not leak-proof could still provide considerable leverage for the United States in a crisis. Obviously there would be major reciprocal constraints on the United States in such a situation. Nevertheless, the Kremlin would have to view the net effect with great concern.

The Soviets might endeavor to escape such a circumstance in several ways. One technique could involve concealment of the location, number, and type of the SRF's offensive forces, an evasive measure in which the Soviets would enjoy a pronounced advantage because of the closed nature of Soviet society. Another could emphasize passive measures such as superhardening and mobility aimed at enhancing the offense's capacity to ride out a U.S. attack and assuring that those weapons could participate in a follow-on campaign. Such measures could be further bolstered by an active defense of Soviet offensive forces to deter American preemption or to allow Soviet forces to ride out an attack. In particularly dire circumstances, the Soviets could consider preempting against U.S. offenses or defenses as the latter were being deployed. And, of course, they could always fall back on the formal adoption of a launch-on-warning strategy, along with appropriate force modifications and exercise demonstrations to enhance its credibility. It goes without saying, of course, that such countermeasures would inject great instability into the peacetime strategic balance.

A more plausible Soviet offsetting response to a U.S. space-based SDI—and the one the Soviets have most vocally threatened in their litany of possible countermeasures—would be a multifaceted effort to negate that capability through such measures as ICBM hardening; the use of decoys, chaff, and aerosols; rotating boosters during their climb-out; increasing the reflectivity of boosters; faster booster burn;

depressed trajectories; fractional orbits; the proliferation of missile forces; and so on. There are also tactical ploys available to the Soviets that might reduce the effectiveness of an American SDI network. For instance, a Soviet attack might be timed to overload a certain echelon of a comprehensive SDI constellation.

Some of these options could impose substantial costs on the Soviets or compel them to sacrifice a significant capability margin elsewhere to evade U.S. defenses. Yet they could also make life more troublesome for us. For example, if the price of punching through an SDI shield were high enough, given the number of available warheads and the Kremlin's targeting objectives, the Soviets might have to resort to one large attack instead of several sequential ones. The net result would be an acceleration of nuclear war and the premature foreclosure of any possibility that such a war, having remained limited up to a point, might be brought to an end by either side short of disaster.

The Soviets could also attempt to negate any SDI deployment by adopting delivery concepts that were not vulnerable to the boost-phase intercept defense currently envisioned.[15] Such a response might include the positioning of missiles closer to the United States (at sea or on the territory of Soviet western-hemisphere allies) to reduce or eliminate their time of flight in space; the use of airbreathing penetrators; the surreptitious insertion of nuclear weapons; and comparable end-run measures. It remains to be seen to what extent the Soviets will attempt to hedge against SDI in this manner. Even *after* the event, it will be difficult to determine with any certainty what increment of weapons the Soviets might have procured expressly as a counter to SDI.

Last in this category, the Kremlin could evade SDI simply by proliferating more offensive forces of all types. It is common knowledge that the Soviets do not routinely worry about elegance as they work to solve military problems. Typically, they resort to brute force as necessary—and sometimes when not. For example, to offset their problem in matching qualitatively superior Western tactical air forces, they have opted for greater numbers and an operational concept that would deliberately sacrifice aircraft to assure adequate coverage of NATO tar-

[15]Indeed, they might seek to acquire such forces in any case. As evidenced by their considerable effort in single-RV mobile ICBMs, new SLBMs, the BLACKJACK bomber, and both air- and sea-launched cruise missiles, the Soviets are already moving in this direction. Moreover, as of this writing, there was some indication that the USSR might ultimately accept restrictions on the number of weapons that could be represented in any one leg of either side's strategic triad, although this premise was not a feature of Gorbachev's deep-cuts proposal in early 1985.

gets.[16] There is no reason to suppose they would not follow a comparable tack in the strategic arena if they feared SDI sufficiently.

If defenses seemed reasonably capable of imposing significant costs, then, the Soviets might simply buy as many weapons as it took to compensate. Attempts to overwhelm SDI this way, however, could lead to a costly competition for both sides. Perhaps imposing such costs on the Kremlin would be a worthwhile side objective of SDI if it appeared likely to pressure the Soviet leadership to divert resources away from more threatening undertakings (and not burden the United States with extra adversities in the process). Of course, things might not work out so well for the United States if the cost-benefit ratio did not begin to tilt to our advantage as SDI-related uncertainties were resolved. Nevertheless, if the Soviets could be made to fear some particular SDI concept enough, they might be induced to participate in an arms control scheme aimed at the reduction of offensive forces.

Introducing Uncertainties into U.S. Planning

A case often made on behalf of SDI concerns the uncertainty it would present to any Soviet planner contemplating hostile action against the United States. This argument holds that even in the presence of a rudimentary SDI, Soviet decisionmakers would have to allow for worse-than-expected outcomes and that this would bolster deterrence in a crisis.[17] Yet the Soviets could complicate U.S. planning by turning the tables and attempting to impose uncertainty on *us* in several ways. One way in which Soviet deceptive measures might make their influence felt would be in a situation in which an SDI defense was configured to absorb a disjointed Soviet retaliation in the wake of a U.S. counterforce attack. Even if that defense could overcome any deceptive ploys the Soviets might attempt, our inability to target a

[16]This penchant now may be declining somewhat with the ongoing introduction of the MiG-29 into the Soviet fighter inventory. This aircraft is an expensive and sophisticated platform in the approximate class of the USAF F-16 and the Navy and Marine Corps F-18. Its advent is expected to lead to a general reduction in the overall size of the average Soviet fighter regiment. Nevertheless, the point still stands with respect to Soviet force posturing as a general rule. For example, even the latest Soviet tanks are not particularly elegant compared with their American counterparts. Nevertheless, they are effective and exist in large numbers.

[17]It is a well-known operational fact that the proper response to defenses of unknown quality is to assume the worst and increase the size of a proposed attack as a hedge against uncertainty. Arguably, Moscow could suffer worse damage in case of war than it might otherwise have sustained because of the presence of an ABM of dubious quality. The only kind of attack that might be ruled out in the face of poor defenses would be a highly constrained limited nuclear option, in which case adding more weapons to an attack package would run up against planning constraints governing the maximum allowable size of an attack.

sufficient number of Soviet launchers in the first place might deter our resort to decisive action in a crisis.

A relatively simple Soviet measure of this sort might be to deny U.S. planners access to essential information on Soviet offensive force capabilities and dispositions. Some proposed SDI approaches are fairly resistant to Soviet efforts to deny the United States important operational intelligence. For instance, any space-based anti-boost-phase SDI constellation would, by definition, have something approaching global defense coverage, with the result that relocating weapons might not buy the Soviets very much.[18] However, terminal defenses with a unique geographic orientation (such as a site located on the northern side of a target) might be susceptible to a variety of deceptive measures. In any case, should the Soviets desire to foil SDI through deception, they could seek ways to deny us information on the number, location, and attributes of their offensive forces. Although countermeasures against these steps would exist for the United States, such a scheme could force us into greater expenditures for a given level of defensive capability, largely because a shortage of critical planning data would require us to assume the worst when it came to estimates of Soviet attack parameters.

Another way for Moscow to heighten the complexity of our SDI planning problem would be to subvert SDI itself. For example, the Soviets might covertly intersperse space mines or similar weapons into the midst of a space-based SDI constellation. As noted above, they could also resort to inserting weapons clandestinely into the United States. Given the asymmetry in the two sides' approaches to internal security, the Soviets would have a distinct advantage when it came to defending against this latter kind of threat.

An important factor contributing to the attractiveness of this countermeasure is the potential disparity between official and public knowledge about the state of play in any such operation. One can imagine a covert conflict of which only a relatively small circle within the U.S. government—but not public audiences—would be aware. Given widespread popular anxieties over the prospect of escalation, the Soviets might count on deliberate U.S. governmental suppression of news about strategic clashes that were not publicly apparent, including events occurring under water, in space, in Arctic regions, and so forth. Alternatively, they might seek to fuel the belief that some kind of conflict developments had already occurred, in the prior knowledge that the U.S. government would be hard pressed to refute such allegations.

[18]The converse of this is that most of the constellation will not have an active role to play during a large-scale contingency. This is a price one has to pay for comprehensive space-based earth coverage.

The Soviets could also contrive, by either direct interference or a staged event, to "prove" the inadequacy of an SDI system. Should elements of an SDI network be tested and found wanting, that would undermine our own (and our allies') confidence in the system, force the United States to deal with the identified operational deficiency, oblige us to alter or abandon any assumptions we might have held when we first planned for possible offense-defense interactions, and so on.[19] This would, of course, be a dicey game for the Soviets, because if our system were shown to be capable of handling Soviet threats, then the shoe would be on the other foot.

An option along these lines less prone to backfiring would be for the Soviets to reveal "new capabilities" from time to time that might undermine the American leadership's confidence in SDI. Such revelation of previously covert Soviet capabilities might generate anxiety among Western defense planners, who would then have to wonder what else was "out there." Because the lead times involved in fielding some SDI components could be quite lengthy compared with the time needed to assemble a "new" Soviet threat, dealing with this kind of stratagem could be enervating if the Soviet disclosures had any credibility whatsoever.

Last, the Soviets could seek advantage from the allegedly crisis-destabilizing features of SDI. Much of the domestic and intra-alliance debate over SDI has addressed the destabilizing potential of some potential SDI elements. This reflects both generic Western uneasiness over changing the existing "rules" of the military balance and a recent resurgence of public controversy over a cluster of associated issues, including accidental war and confidence-building measures.[20] Space-based systems, especially those with nuclear charges or those that were unrecallable once launched, might have to be called into play on short notice, possibly within a few minutes after the onset of a Soviet attack.

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[19]Note, however, that our *own* tests of the system might also reveal major flaws, a possibility that should be kept in mind during our SDI R&D. Recall, for example, some of the tests proposed in the 1960s and early 1970s (among them the Giant Patriot program, subsequently cancelled) in which test-configured Minuteman ICBMs were to be launched from operational silos. Some tests failed and revealed problems. Clearly there comes a time in any design and deployment program when one might not want to ask the question lest one be too deflated by the answer.

[20]In this regard, there has been a spate of recent books in the "avoiding nuclear war" genre that have commented on the various dangers and dilemmas of a nuclear-armed world. Among the most prominent are Albert Carnesale et al., *Living with Nuclear Weapons*, The Harvard Study Group (Bantam Books, New York, 1983); Graham T. Allison, Albert Carnesale, and Joseph S. Nye, Jr. (eds.), *Hawks, Doves, and Owls: An Agenda for Avoiding Nuclear War* (Norton, New York, 1985); and Barry Blechman (ed.), *Preventing Nuclear War: A Realistic Approach* (University of Indiana Press, Bloomington, 1985).

Through propaganda or actual provocation along the margins, the Soviets could amplify Western concerns over this prospect. Given the considerable impact of public opinion on U.S. national security planning, such missile rattling could yield tangible dividends for the Soviets. Again, however, such a strategy might lead to its own failure if not deftly employed. Overdoing the threat-mongering could simply sell more Americans on the need for a comprehensive SDI.

BROADER STRATEGIC STEPS

Here, we have in mind Soviet responses that would seek to rearrange the larger chessboard of East-West relations, rather than those involving purely technical innovations or changes in operational plans. Perhaps the most appealing option in this regard would be an attempt to escape the imposition of excessive cost burdens on the Soviet defense effort as a result of SDI. It is widely assumed that a BMD competition would be run on terms favorable to the United States, primarily as a consequence of our lead in high-technology applications. Indeed, many are convinced that the United States could involve the Soviets in a competition so expensive in absolute terms that the Kremlin would have to divert substantial resources away from its most threatening activities, such as ICBMs and power projection forces, toward less threatening ones like ABM. In light of Moscow's visible respect for American technological prowess, there is something to be said for this proposition. The situation may even be so discomfiting to the Soviets that we could use the threat of an SDI competition to motivate the Kremlin to follow programmatic lines favorable to us. However, one can imagine some effective Soviet counters to any such American aspiration.

To begin with, the Soviets could simply ignore SDI—or convey the impression of not being impressed, as Stalin did regarding the atomic bomb until he got one too.[21] They might decide that the odds of SDI materializing were not high in any case and try to play on that chance to deny the United States any confidence that it was gaining much by pursuing strategic defenses.[22] Or they might conclude that, in view of the lengthy lead times involved, they could afford to coast for a while,

[21]See George Quester, "On the Identification of Real and Pretended Communist Military Doctrine," *Journal of Conflict Resolution*, June 1966, pp. 172–178, for an amplification on this Soviet stratagem.

[22]If the Soviets genuinely believed that SDI would never amount to anything, they might even shrewdly attempt to convince Americans that they greatly *feared* SDI so as to encourage wasteful spending on an unproductive program. Whether the Soviets would be capable of such a subtle scheme, however, is questionable.

committing their resources toward other priorities until it became clear that SDI required an active response on their part.

Alternatively, the Soviets might see SDI as such a serious long-term threat that it would inevitably result in a confrontation sooner or later. In this case, they might instead funnel their resources toward more immediate priorities, such as theater and intercontinental nuclear forces, in the hope of better situating themselves to preempt against SDI before it was fully operational should the need occur. Alternatively, they could emphasize longer-term investments, such as a high-technology production base, which could help boost economic productivity yet still be "drafted" into a counter-SDI effort should that need someday arise.

Conversely, the Soviets could try to turn the tables by imposing a countervailing burden-generating threat on the United States. In this case, Moscow's response might not primarily involve strategic offensive or defensive forces. Instead, the Kremlin could seek to respond in some other area where the USSR held a relative advantage. Such a response might prove particularly appealing were the Soviets technologically unable or otherwise disinclined to engage the United States more directly. Or it might be adopted if the Soviets had strong doubts that SDI would ever see the light of day, yet still wanted to pursue some military goal using the "excuse" of a new arms race that had been provoked by the Americans. The purpose of such a response might well be to impose such costs on the United States in other important mission areas that SDI would suffer a cut in funds and be less able to proceed as a result.[23]

In responding to SDI along these lines, the USSR can capitalize on certain asymmetries in the Soviet-American relationship, either to reduce its own costs or to present the United States with an adverse cost-benefit situation in return. The most obvious area of relative Soviet advantage here is the leadership's ability to impose a draconian regime on its people. Taking civil defense in its broadest sense to include population protection by a mix of sheltering and dispersal, industrial hardening, and so forth, the Soviet Union would enjoy a pronounced comparative advantage in its ability to emerge from a nuclear campaign with significant percentages of its leadership, social control, military, and labor forces intact, even in the face of deliberate American targeting strategies against these assets.[24] Other Soviet advantages

[23]Most likely such a countervailing scheme would involve some aspect of the conventional balance to exploit the relative Soviet advantage in this arena.

[24]It would be impossible to generate a comparable degree of civil defense in the United States unless some dire set of events persuaded the public that a nuclear conflict was inevitable *and* provided enough time for the country to exploit its considerable *latent*

might not be strictly defensive in nature. For example, the Soviets could be relatively better off in an unrestrained arms race aimed simply at overwhelming American defenses as the latter came on line. Were the USSR to attempt to produce more ICBMs than the United States, it would find itself less constrained politically when it came to missile siting, the ability to deploy mobile missiles, and so on.

Another effort to end-run SDI by altering the broader strategic landscape could come in the form of a Soviet attempt to negate America's extended deterrent forces. "Extended deterrence" refers to a property of our nuclear forces that enables them to discourage both a direct Soviet attack on the U.S. homeland *and* Soviet aggression against especially important peripheral theaters. There was a time when the United States (and probably the Soviets as well) believed that extended deterrence was solidly at work in many locations. Over the years, however, this putative capability has been more and more eroded, to the point where it may now be contributing reliably only to the deterrence of a Soviet attack on Western Europe, if even there. Whatever the case, Soviet defenses fielded in response to an alleged "U.S. provocation" could undermine extended deterrence, because the most likely sort of intercontinental attack that would be ordered to enhance our theater defense and intrawar deterrence prospects—a limited strike seeking some precise operational aim and not just a demonstration salvo—would be ruled out by even moderately capable Soviet area defenses.

Relatedly, Moscow could pursue a politically inspired gambit to negate the independent nuclear deterrents of the Western allies. No doubt the Soviets have a special desire to neutralize not only the deterrent forces of Britain and France, but also those of China. To date, they have sought to do this within the bounds of the ABM Treaty. Although the Moscow ABM cannot fend off a determined U.S. attack, it might eventually be more successful against a third-party strike—or drive up the costs for any third party attacking Moscow to such a degree that the attacker would have few weapons left over with which to accomplish other targeting aims. The Moscow ABM may also provide insurance against a bolt-from-the-blue U.S. decapitation attack, a threat that became more ominous to the Soviets with the deployment of Pershing II. As the overall threat to the Soviet capital and other

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civil defense potential (including the availability of private transportation, food and medical reserves, and so on). Another issue involves the permeability of a nation's borders to surreptitious threats such as bombs introduced covertly in peacetime or weapons infiltrated during a crisis by strategic special-operations units. The Soviet Union has an obvious advantage when it comes to border integrity and the ability to monitor activities within its home territory.

important targets increases with new weapons such as Pershing II and the sophisticated weapons now programmed by the United Kingdom and France, if not China, the Soviet leadership might attempt to blame SDI for an opportunistic decision to abandon the ABM Treaty, either in whole or in part.

Such a strategy could also affect U.S. regional interests around the world. After all, defense of our own homeland against a Soviet attack is neither the sole nor the most demanding security problem confronting us. Defending continental theaters along the periphery of the Soviet bloc is an extraordinarily daunting task, given the voluntary nature of our alliances, the proximity of the Soviet Union to many important regions, the inability of the United States to maintain a sufficient inventory of forces in all regions of interest to accommodate possible threats with equally high confidence, and the fact that the first blow must probably be conceded to the Soviets.

Since World War II, it has been the case more often than not that nuclear weapons have proven a far less expensive (if not less risky or credible) solution to Soviet threats than more traditional military forces. For numerous reasons having to do with the nature of their political system, the Soviets may be able to put additional combat assets on line in high-priority theaters at a lower unit cost than we can. If so, they might seek to compensate for a large-scale SDI effort by substantially ratcheting up the conventional threat we face in many locales. American options in such a case would be either to counter the threat in kind or, more likely, to generate yet another countervailing threat, probably in the form of nuclear offensive forces. The feasibility of the latter would depend on a host of uncertain factors, such as the extent to which SDI provided a reliable defense for ourselves and our allies, the degree to which Washington and Moscow had found ground for cooperation in a joint transition to a defense-dominated strategic relationship, and the state of the intercontinental and theater nuclear balances.[25]

A final "grand strategic" effort to counter SDI could entail Soviet steps to ensure American defeat in case of war, whatever the *military* outcome of the conflict might be. For example, given an advantageous balance in forward theaters, the Soviets might persuade themselves that the gains they could make in a theater war would outweigh the damage the United States could inflict in a central nuclear campaign.

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[25]There is at least one precedent for this Soviet tactic. At the height of American superiority in central nuclear forces, the Soviets deployed both conventional and theater nuclear forces sufficient to do grave damage to forward U.S. security interests in Europe. For discussion, see Robert P. Berman and John C. Baker, *Soviet Strategic Forces: Requirements and Responses* (The Brookings Institution, Washington, D.C., 1982).

Auxiliary steps the Soviets might pursue to reinforce such an outcome could include an expanded civil defense program; strategies to hold key U.S. value targets hostage (thus trying to deter American attacks on Soviet forces advancing in forward theaters or even attacks against the Soviet Union itself); dramatic arms reduction arrangements, including tactical and theater nuclear arms, intended to reduce the total amount of damage the United States could do; and so on. This strategy might be especially appealing if SDI looked to be promising but was available only at such a high cost that we would be unable to match increased Soviet preparations for theater operations.

Such an effort failing, the USSR might seek to negate any strategic advantages accruing to the United States from SDI by indulging in particularly dastardly counterstrategies. The Soviets might, for example, attempt to acquire a "doomsday" device based on very dirty or high-yield weapons, somewhat along the lines of the "deterrent" that figured in the satirical movie *Dr. Strangelove*. In this case, even minor SDI failures would be far worse than would otherwise be the case.

As a frantic last resort, the Soviets could even threaten to detonate nuclear weapons in remote forested areas within their own country, hoping that such a "spoilsport" measure might inflict the consequences of "nuclear winter" on the United States. Surprisingly enough, such a threat has been hinted at in Moscow's polemic against SDI. Valentin Falin, for example, once pointed out that "no ABM options will change the fact that a precisely known quantity of nuclear devices detonated simultaneously on one's own territory would have irreversible global consequences."[26] Granted, such a self-destructive act is so implausible on its face that it hardly warrants further consideration as a serious Soviet option. We mention it at all solely because it has obviously occurred to the Soviets, even if only as a propaganda device.

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[26]Valentin Falin, "Space—The Moment of Truth," *Izvestiia*, December 14, 1984.

IX. LOOKING TO THE FUTURE

Although the returns are far from in, some interim conclusions are suggested by Moscow's positioning with regard to the Strategic Defense Initiative so far. Clearly the Kremlin has accepted SDI as a challenge it cannot allow to go unanswered. Yet the record of Soviet behavior regarding the issue since 1983 has been mixed. As we saw above, the leadership was slow to react to SDI at first, most likely because of its preoccupation with attempting to block NATO's impending deployment of Pershing II and GLCM at the time President Reagan announced the program. The Soviets also may have been inclined to wonder at the beginning whether SDI was anything more than a passing phenomenon of American politics associated with administration efforts to bolster Congressional support for its FY1984 defense budget submission. Whatever the case, it was only a year later, after SDI had begun to show clear organizational and fiscal signs of durability, that the Soviets became serious enough about the program to dedicate their full efforts toward defeating it politically.

By 1985, SDI had become the centerpiece of Soviet-American relations. It is now generally accepted that the program was pivotal in leading Moscow back to the Geneva arms talks, which the Soviets had walked out of unilaterally in November 1983 over INF.[1] At the same time, SDI occasioned a Soviet propaganda campaign of near-unprecedented intensity. With due allowance for Soviet hyperbole, the stridency of the Kremlin's pronouncements against SDI during this period almost certainly mirrored accurately the leadership's forebodings about what the program might portend for Moscow's standing in world affairs.

Such an impression was reinforced by Soviet conduct at the Reykjavik summit in 1986. At that summit, Gorbachev insisted that the United States effectively give up SDI as a precondition for any Soviet concession on offensive forces. Although controversy persists in the United States over which side was mainly at fault for the failure of that meeting to yield an arms control breakthrough, there is a plausible case that Gorbachev's behavior was less reflective of any real Soviet interest in sweeping offensive force reductions than it was of the

[1]Former President Nixon and Henry Kissinger have asserted that "no one can deny the decisive role of the Strategic Defense Initiative in bringing the Soviets to the negotiating table." "To Withdraw Missiles, We Must Add Conditions," *Los Angeles Times*, April 26, 1987.

Kremlin's firmly rooted determination to kill SDI. In this interpretation, knowing beforehand that he would not succeed in convincing President Reagan to forsake SDI, Gorbachev nevertheless presented his extravagant ICBM reduction offer with the expectation that it would be declined by the United States, thereby enabling him at least to gain a cost-free propaganda windfall by allowing him to put the perceived onus for the "arms race" on the United States. If this assessment lies anywhere close to the mark, Gorbachev went to Reykjavik to begin with not in any spirit of participation in the "arms control process," but expressly in the service of his campaign against SDI, using arms control as the medium and the language of that campaign.

More recently, Soviet pronouncements on SDI have come to radiate a less anxious tone in parallel with the mounting trouble the program has begun to encounter on the American domestic scene. For example, at this writing, the original administration FY1988 budget request of $5.4 billion for SDI had been marked down to $4.5 billion by the Senate Armed Services Committee and seemed headed for an even further cut to $3.6 billion by the House Armed Services Committee.[2] As the domestic fortunes of SDI have appeared more and more reminiscent of previous American homeland defense efforts in the face of rising fiscal constraints and mounting second thoughts among responsible defense professionals, the Soviets increasingly appear to have adopted a less agitated public stance on the issue.[3] Clearly they remain hopeful that the program can be brought to an early demise politically. But there is little evidence that Moscow senses any need, at least yet, to begin gearing up for a crash effort to counter SDI, especially in the continued absence of any clear sign of what SDI itself may ultimately entail. Beyond that, the Soviet military R&D infrastructure is not well suited for quick reactions and crash programs in any case. On the contrary, the Soviet system inhibits such fits and starts and instead prefers incremental progress toward carefully laid-out programmatic goals. This operating style, by one informed account, reflects a certain institutional "stickiness" that "argues against rapid, tailored responses."[4]

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[2]David Lauter, "Senate Panel Approves $4.5 Billion 'Star Wars' Budget for 1988," *Los Angeles Times*, May 1, 1987.

[3]Such an outlook undoubtedly gained strength from a recent report by an authoritative panel of civilian and military scientists organized by the American Physical Society, which concluded that any SDI system based on lasers or directed energy would need at least a decade or more of intensive research simply to determine whether or not the system would be workable in principle. See R. Jeffrey Smith, "Early SDI Deployment Infeasible, Experts Say," *Washington Post*, April 24, 1987.

[4]Sayre Stevens, "Ballistic Missile Defense in the Soviet Union," *Current History*, October 1985, pp. 74, 76.

Relatedly, there is no evidence that the Soviet leadership views SDI first and foremost as a *military* threat to Soviet security. Both in their public statements and in private remarks to Westerners, the Soviets have evinced little doubt that they can cope with SDI technically should the need arise. Yet they also project every impression of viewing SDI as threatening a new arms competition that they would genuinely prefer to forgo. Whatever fears Soviet military planners may harbor regarding the long-term strategic implications of SDI, they and their superiors have ample grounds for worrying about it for at least three more immediate reasons.

The first of these is the economic challenge discussed above. This could not have come at a less opportune time for the Soviet Union, given Gorbachev's urgent need to revitalize the domestic economy. Second, the prospect of an American space-based ABM threatens the image of Soviet "equality" to the United States by portending a technological competition in which the Soviet Union would find itself at a severe disadvantage. Third, SDI has injected new dynamism and uncertainty into the strategic balance at a time when the Soviet Union had become relatively adjusted to its predictability. It is this generic affront that SDI presents to Moscow's sense of position in international affairs that lies at the heart of the Soviet leadership's discontent over the program.

It is almost impossible to say to what extent Soviet R&D trends in offensive and defensive weapons technologies have shown anything approximating the beginnings of a formal response to SDI. Since the program remains, even after four years, almost entirely a concept development effort, one might not expect much evidence to have presented itself that would indicate the onset of a Soviet institutional reaction, even assuming we could correctly identify such a reaction if we saw it.[5] Yet there is little doubt that the Soviets are determined to maintain the moral high ground in blaming the United States for provoking another needless round in the "arms race." They are also striving to put the United States on notice that they will not accommodate to American "rules" in responding to SDI.

Granted, much of what the Soviets have said or implied about their possible responses merely repeats points commonly aired in the Western debate, including the notion that they will not be suckered

[5]On the other hand, the announcement of SDI by President Reagan in 1983 preceded by only a year or so the beginning of the USSR's latest Five-Year Plan, which includes a substantial defense component. Since the Kremlin is now approaching the point at which workups for the next Five-Year Plan should be getting under way, now would seem to be a propitious time for the intelligence community to begin looking hard for such indicators of an emerging response pattern.

into countering SDI with a reply in kind. But this does not mean that any Soviet SDI counters that may eventually see deployment have not been included, in one form or another, in that bill of particulars. Certainly the list of options enumerated in the report by Velikhov, Sagdeyev, and Kokoshin is fairly inclusive of at least the near-term possibilities. Indeed, on the eve of his trip to India in November 1986, Gorbachev allowed that the Soviets had *already* decided (perhaps from this menu) what their near-term reaction will be should further progress in SDI render any such decision necessary. "SDI does not scare us," said Gorbachev. "We have thought out what we should do if the Americans keep working on SDI."[6]

This brings us to the difficult challenge of anticipating future Soviet responses to SDI. Obviously, the less finely we tune our predictive scope, the more reliable any resulting predictions will appear. After all, it stands to reason that the less we are prepared to say about specifics, the greater the chance our predictions will be correct. Yet in the case of Soviet counters to SDI, we can identify broad clusters of plausible SDI fates that fairly well cover the waterfront, at least at the highest level of aggregation. By even a rough-order culling of scenarios, the number of alternative Soviet "SDI response futures" can be reduced to manageable proportions.

Consider the three most notable cases in this regard. First, we can postulate a situation in which SDI progresses on a sustained basis through the mid-term future. Despite a turbulent beginning and the continued vulnerability of SDI to domestic political developments, it is conceivable that a coherent American ballistic missile defense might emerge in the foreseeable future. This defense, moreover, could prove more extensive than one merely suited to defending American retaliatory forces and command and control nodes. Indeed, it could ultimately presage a nationwide level of quite respectable protection against the entire spectrum of ballistic threats the USSR presents. The United States could also pursue measures for expanding this coverage to include key allies around the Eurasian periphery. As major technological discoveries are made or as progress in arms control occurs, these may be consolidated into the ongoing SDI plan as well. In short, the SDI "future" in this scenario is not one that would be driven by (and subordinated to) external forces. On the contrary, it would be one that proceeded roughly in the direction originally intended in President Reagan's March 1983 speech, even though the specific phases, technologies employed, military context, and other factors might prove very different from those that scenario writers in the mid-1980s thought most likely.

[6]Associated Press dispatch, November 24, 1986.

Second, there is the possibility that SDI could run out of steam in fairly short order. In this case, SDI would follow the fate of earlier American homeland defense schemes over the last three decades and expire for many of the same reasons that ultimately did in its predecessors. With costs rising, political problems looming, other military priorities pressing, domestic turbulence growing, technological hopes not panning out, and other obstacles emerging, a new administration succeeding President Reagan could choose to cut its losses and terminate the original ambitious SDI plan. This would not, of course, necessarily preclude SDI from realizing *some* payoff (possibly even a significant one) for such applications as ATBM defenses for NATO or some sort of terminal defense for vulnerable national command centers and ICBMs. However, the nationwide SDI scheme originally contemplated would be brought to an end in the fairly near term, perhaps before 1990. Until then, spending levels could remain significant, possibly as high as $2 billion to $4 billion a year. But it would become clear well before the actual demise of the program that too many hurdles remained to be overcome. In this event, the Soviets could make a reasonably low-risk estimate well before the fact that SDI's days were numbered, at least as far as the need for an immediate countereffort was concerned.

Third, one can imagine a case in which SDI eventually collapses, but not before inspiring substantial compensatory behavior on both sides. This scenario would combine the dominant features of the preceding two outlined above. Here, defying the predictions of most critics, SDI would proceed apace for a number of years. An appropriate mix of technical achievement, budgetary commitment, adjustment to the ABM Treaty, alliance support, and public opinion would deny Moscow any confidence that SDI could be easily manipulated into oblivion or onto some side track. Whether or not a specific architecture was laid down, it would be apparent that some of the more demanding features of an ambitious SDI system would lie within the realm of realistic solution, even though those solutions might not be near-term likelihoods.

Obviously it would be wholly speculative at this point to predict which of these SDI "futures" has the greatest likelihood of occurring. But it is not so difficult to assess their relative gravity in Soviet eyes or to anticipate probable Soviet reactions in each case. Undoubtedly the Soviets are continuing to direct their main efforts today toward helping to engineer the second of these contingencies, namely, the early political dissolution of SDI. Having largely failed in their propaganda attempts to bring about an erosion of American and West European support for continued SDI research, the Soviet leadership now appears to have adopted a more composed stance on the issue and sought

instead to seek leverage against SDI in the arms control forum. In this respect, Soviet pronouncements have significantly toned down their earlier stress on the "countermeasures" theme and have adopted instead a more positive attitude emphasizing the Kremlin's commitment to "peace" and negotiated solutions to the nuclear arms competition. Indeed, SDI may also have induced the Soviets to slow down the more visible aspects of their own BMD development effort in the interest of reducing its propensity to help legitimize SDI in the West. For example, there were reports in early 1987 that the Soviets might be dismantling at least a part of their Krasnoyarsk radar system.[7]

Should Moscow's diplomatic and arms control efforts fail in the next few years to halt the progress of SDI toward a deployable American BMD capability, the Soviets will feel mounting pressure to begin laying the foundations of an infrastructure capable of supporting at least the development of those longer-lead-time items that will be required for any SDI countermeasure scheme. Even in that case, however, the Soviets will have ample time to continue monitoring the direction and progress of SDI before committing themselves to any programmatic response. During that period, they will still be able to wage a rear-guard effort to subvert SDI politically in the hope that the third scenario etched out above might be realized, namely, a gradual dissipation of SDI *after* substantial progress has been made on both sides.

In the worst case, namely, one in which the ABM Treaty becomes superseded by the imminent deployment of an American space-based BMD network as a result of SDI, the Soviet Union will have to supplant its reliance on rhetoric and persuasion with more tangible gestures if it intends to retain at least the image, if not the reality, of being a serious competitor to the United States. Perhaps the simplest interim measure to signal that the Kremlin had taken up the SDI gauntlet would be for the Soviet Union to constitute, amid much public fanfare, an SDIO-like "countermeasures" organization. A more determined response that also might not require any major diversion of resources from other activities would be to sabotage or preempt any SDI deployment before it attained full operational status. The likelihood of any such effort occurring clandestinely will turn heavily on the extent to which the Soviet leaders felt that they could succeed in getting away with it. As noted above, however, any such overt measures would be extraordinarily provocative. Although the Soviets might be less hesitant about carrying out moves of this sort in a deep crisis or at the edge of war, we would not ascribe much likelihood to such a bold

[7]See Michael R. Gordon, "Arms Negotiators Plan New Effort," *New York Times*, February 1, 1987.

resort in normal peacetime conditions, at least in the absence of a leadership possessed of far greater risk-taking inclinations than the current one or its predecessors have demonstrated.

Yet another Soviet alternative in the continued presence of an aggressive SDI effort would be to abandon further pretense at restraint and leap smartly into a full-fledged ABM breakout, vigorously pursuing all varieties of RDT&E in exotic technologies and expanding the Moscow ABM into a nationwide BMD capability based on existing radars and interceptors. In our judgment, such a development is unlikely for several reasons. For one thing, there is the grossly disproportionate cost factor that would attend any serious Soviet emulation response in comparison to more modest offsetting measures. A determined Soviet attempt to copy SDI could impose unbearable opportunity costs on other sectors of the Soviet economy, require painful compromises in competing areas of military development, and commit the Soviet Union to a technological competition in which it would face a definite possibility of being bested by the United States. Beyond that, an excessive concentration on emulating SDI at the expense of overcoming it would be inconsistent with the long-standing offensive thrust of Soviet military development. Unless Soviet doctrine takes a radical turn in its philosophical orientation, strategic defense will continue to be regarded as a backstop for Soviet offensive forces rather than as an alternative means of assuring Soviet security.

Finally, a Soviet ABM breakout seems unlikely simply because of the great extent to which the USSR has been able thus far to improve its BMD technology base *within* the constraints of the ABM Treaty. Of course, in the event of an outright abrogation of the Treaty by the United States, any such consideration would be rendered moot for the Kremlin. But that is a remote prospect at best. Short of it, a Soviet breakout would merely strengthen support for SDI throughout the United States and Western Europe, yielding precisely the outcome the Soviets have sought all along to avoid. Although continued R&D in various BMD technology areas at a lower level can surely be expected of the Soviets, they are more likely to accommodate SDI, at least in the immediate decade ahead, through continued public diplomacy and arms control efforts.

Indeed, the Soviets have repeatedly *told* us that they would find greater merit in pursuing measures to suppress or overcome SDI than to copy it. Two of their key spokesmen on SDI have been quite explicit on this point. In Academician Sagdeyev's words, "our deep belief is that the best response on our side is not to copy the defensive

approach."[8] Academician Velikhov echoed this refrain when he noted that the Soviet Union will do what it must to maintain the strategic balance in the face of SDI but will not "get involved in any adventures of the 'Star Wars' kind."[9] Of course, such statements have carefully avoided mentioning the obvious fact that the Soviet military would be the last to endorse any SDI emulation if that required it to watch its intercontinental attack capabilities steadily dwindle away in the process. Beyond that, in large measure this Soviet disavowal of interest in the emulation option entails making a virtue out of necessity, considering the manifold economic and technical problems associated with the emulation response discussed above. Nevertheless, the fact that Soviet spokesmen have been so adamant in pursuing this refrain is no reason for us automatically to dismiss it.

Even the need to pursue an *offse ing* response to SDI may not be as pressing upon the Kremlin as many in the West sometimes assume. Indeed, the Soviets may inadvertently have told us as much through the unusual enthusiasm with which they have "warned" us about what they might do should such a response ultimately prove necessary. Through the vehicle of the report on space weaponry by Velikhov, Sagdeyev, and Kokoshin, the Soviets have been uncommonly candid in discussing possible responses whose implementation still lies far in the future. Normally, they make it a practice not even to hint at military programs they actually have under way or may be considering, in routine keeping with their traditional penchant for secrecy.

Furthermore, Soviet planners undoubtedly appreciate that SDI could follow such an erratic and unpredictable course that they could end up wasting a lot of money chasing blind leads were they to leap prematurely into any programmatic response. This prospect lends further support to the likelihood that Moscow's immediate concern over SDI is more political than technical. After all, the Soviet leaders are well aware that despite the confident rhetoric of President Reagan, SDI is on less than firm footing in the American domestic arena. At best, it promises to be technically problematic, extraordinarily expensive, disruptive of the ABM Treaty, and uncertain as to its ultimate prospects for deployment.

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[8]Cited in John J. Fialka and Frederick Kempe, "Soviet Hostility to Star Wars Reflects Strategic Concern—Or Is It Economic?" *Wall Street Journal*, November 26, 1985. In a subsequent response to a Moscow television interviewer's question as to whether it was essential for the Soviet Union "to oppose the U.S. 'Star Wars' program with something similar, equivalent, or symmetrical," Sagdeyev gave much the same reply: "It is very difficult and practically impossible to create an ideal defense against nuclear warheads." However, he said, science and technology do offer "means to penetrate SDI, to suppress defense echelons, and to saturate it using a variety of methods." "Studio Nine" program, Moscow television service, August 23, 1986.

[9]"Russian Scientists Call SDI Shield Full of Holes," *Baltimore Sun*, December 19, 1985.

On the other hand, the American *threat* to deploy SDI trades heavily on the promise of a variety of technologies in which the United States is widely acknowledged to maintain a substantial lead. In this regard, it is remarkable how quickly the Soviets—who, at least in one interpretation, signed the ABM Treaty in the first place with the express intent to cheat at the margins, while using it as a means to buy time for their own BMD effort—have now come to be such vigorous proponents of strict construction of that Treaty under the pressure of SDI. As a case in point, the Chief of the General Staff, Marshal Akhromeyev signed an article in 1985 in defense of the Treaty whose detail and intricacy of argument suggested for all the world as though it were an advocacy brief put together by a Philadelphia lawyer.[10] Shortly thereafter, Gorbachev himself followed suit in urging that the United States show its commitment to stability by formally "reaffirming" the ABM Treaty—a negotiating point that continued to dominate Soviet public diplomacy right up to the Geneva summit and beyond.[11]

Insofar as the Soviets recognize this American advantage and harbor such abiding respect for American technological prowess, their real short-run concern is that SDI may deprive the considerable Soviet nuclear posture of much of its *political* utility. Indeed, the more knowledgeable and astute Soviet Americanologists may be privately advising their Kremlin bosses to continue a high-visibility public stance of indignation against SDI, but otherwise to keep their deeper fears under control in light of the continuing possibility that SDI could die a natural death at the hands of the American budgetary process, with perhaps some generous assistance from Soviet propaganda and covert action.

For the longer run, obviously, Moscow's responses will depend heavily on the bureaucratic and technical fortunes of SDI. Perhaps the worst outcome for the United States would be one in which the domestic consensus behind SDI collapsed *after* enough momentum had gathered to drive the Soviets into vigorous offsetting measures that could not be easily turned off, and that might indeed assume heightened attractiveness to Soviet planners in the absence of an opposing U.S. BMD capability. In this case, we would have a Soviet response to a U.S. nonprogram, much as we saw with the SA-5 and MiG-25, both of which were conceived in the late 1950s as answers to the abortive U.S. B-70. The critical difference would be that while the SA-5 and MiG-25 are of less than prepossessing concern today to U.S. planners

[10]"The ABM Treaty Is an Obstacle in the Path of the Strategic Arms Race," *Pravda*, June 4, 1985.

[11]William J. Eaton, "Soviets Urge U.S. to Affirm ABM Treaty," *Los Angeles Times*, July 6, 1985.

responsible for assuring B-52 and B-1 mission effectiveness, a substantially expanded Soviet offensive posture (including greater numbers of warheads, bombers, and cruise missiles), along with a more capable Soviet BMD system, could give Moscow precisely what we originally sought to deny it through SDI, namely, a credible first-strike capability that could be invoked with great coercive effect in a crisis.

An even more disconcerting harbinger of what could happen were SDI terminated after Soviet compensatory measures had been set in motion can be seen in the adverse consequences that have ensued from our failure to proceed with an orderly deployment of the MX ICBM. Had the United States remained on course with the original plan to field 200 of these weapons in a survivable shell-game basing mode, we might now be confronting the Soviets with a hard-target kill capability much like the one they have long presented to us via the SS-18 and SS-19, a threat that we remain incapable of reciprocating against them even today, a decade later. Moreover, we would be enjoying a renewed lease on the survivability of our ICBM leg of the Triad to match that promised to the USSR by the mobility of their SS-24 and SS-25, both of which were evidently *inspired* by MX.

Whatever the case, assuming that SDI does result in the beginnings of an American BMD deployment at some point in the future, the Soviets will be driven to respond within the limits of their technological and budgetary resources. As we have tried to show in this study, however, conjuring up the various options that are technically possible, intuitively reasonable, and consistent with past Soviet practice is relatively easy compared with the more daunting task of actually predicting which path the Soviets will follow. In a comment on plans to anticipate Soviet countermeasures against SDI, the former chief scientist of SDIO, Gerald Yonas, pointed out in 1985 that his aim would be to establish "not what they can do but what they will do."[12] This is a worthy goal of any such effort at threat assessment. But it is doubly demanding in this instance because it calls for a forecast in the presence of uncertainty not just about *Soviet* intentions and concerns, but also about what the *United States* eventually will do with regard to SDI.

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[12]Cited in Boyce Rensenberger, "Star Wars Team Seeks Countermeasure Flaws," *Washington Post*, May 28, 1985.