PART II

THE ABM DEBATE
STRATEGIC DEFENSE AND NATIONAL SECURITY

by

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ABSTRACT

THE ABM DEBATE: STRATEGIC DEFENSE AND NATIONAL SECURITY

The Anti-Ballistic Missile (ABM) issue has a long history in the United States. This history entails not only the politics of national security affairs and the decision processes of the federal bureaucracy, but also two other sub-issues of major relevance to aspects of defense policy. ABM systems, like certain other military weapons, are highly complex technical devices, and the ABM issue consequently encompasses a wide range of technological problems and developments. Also, these systems constitute an implementing tool for the strategic weapons policy—the nuclear strategy—of the United States.

This study provides examination of these three aspects of modern American defense policy as it analyzes the ABM issue. The study examines the political positions and arguments present in the debate, documenting the manner in which modifications in the political influence of various individuals and organizations involved in the debate in turn influenced the nature of the ABM controversy.

The technical development of ballistic missile defense concepts and systems is traced, and analyses of the role of technical uncertainty are presented at a number of points where such uncertainty has been a major issue in the political debate. Also covered is the issue of offensive missile technology, as this factor constitutes a major determinant of individuals' perceptions of the utility of ABM systems. Examined too are the ways in which these kinds of technical information and estimates were inserted into the ABM debate, and the roles of certain technical experts in the issue are detailed.

The evolution of general United States nuclear war strategy in the 1960's is analyzed and related to the status of the ABM deployment question. The changes in the weapons capabilities of certain potential enemies of the United States are documented, along with investigation of the impact of those changes upon the political environment surrounding the ABM debate. Finally, the study provides an examination of the utilization of new techniques of systematic policy analysis in making weapons acquisition decisions in fulfillment of nuclear strategy. Examples are presented which indicate the ways in which alternative frameworks for such systematic analysis act to focus debate on policy choices.
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EDWARD RANDOLPH JAYNE II
Cambridge, Massachusetts
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CHAPTER I

INTRODUCTION

On September 18, 1967, Secretary of Defense Robert S. McNamara announced that the United States had chosen to construct an Anti-Ballistic Missile (ABM) system, ostensibly to counter the future threat of the Chinese Communist nuclear missile force. The Secretary's speech stands as a landmark in a long and often heated debate over the desirability and feasibility of ballistic missile defense, a debate which has commanded the attention of four American Presidents and their respective administrations. The ABM issue has a history which is unusual in the following sense: Over the course of ten federal budget cycles, from 1957 through 1966, American administrations rejected military requests to deploy an ABM system, but continued to support fully research and development programs to improve missile defense technology. After ten years of opposition to ABM deployment, a U.S. administration had finally chosen to produce such a system. It was a growing curiosity about this decision that provided the initial motivation for this study. Why, after so many years of saying "no" to ABM deployment, had the United States chosen to provide an ABM system for itself?

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2 The post-World War II history of U.S. military weapons acquisition shows few if any comparable issues argued over such a length of time without the government taking action either to cancel completely or to approve some production of the weapon involved. For a detailed examination of the weapons acquisition history in the U.S. since 1940, see Merton Peck and Frederic Scherer, The Weapons Acquisition Process (Boston: Harvard Business School, 1962).
This is an historical analysis, a descriptive examination of an issue in American defense policy. The following ten chapters document the nature of the ABM debate from its vague origins during World War II up through Secretary McNamara's address in San Francisco. The study's format is dictated for the most part by the nature of the federal budgetary process, and concentrates on those portions of that process in which the ABM issue became a salient question for those persons involved in defense policy decisions. To the extent practicable, the following questions have been utilized to determine inclusion or exclusion of information: What was the status of the ABM deployment debate at a given time—who was taking what position and what were the arguments being voiced—and what political, strategic, and technological factors were associated with those arguments?

**THE CASE STUDY AS A BASIS FOR GENERALIZATION**

The ABM question has been recognized in many quarters as one of the most important issues in modern national security affairs. However, the intrinsic significance of this case does not guarantee the validity of generalizations about the defense policy process derived from the ABM example alone. Nevertheless, the characteristics of process and policy described herein certainly represent possible bases for the development of general theory concerning political processes,

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strategic weapons postures, and the impact of technological complexity on policy-making. The following chapters do not represent any overt attempt at such general theory, and yet there are within those chapters observable trends which may be expanded into postulates about the nature of the defense policy process in the United States.⁴

In particular, there are a number of general issues relevant to American defense policy—issues whose relevance to the political process transcends this particular case—for which the study provides bases for generalization. This work is not basically an exercise in theory building, but the author feels nonetheless that it does illustrate certain trends and conditions germane to such theory. Therefore, it is useful to describe briefly some of these issues and indicate their relationship to the ABM case.

I. National security as a major political issue. The past fifteen years have seen issues of defense policy rise to the forefront of American politics on more than one occasion, and these experiences have left their impression upon many participants in the political process. The legacy of the 1960 presidential campaign's "missile gap" has been particularly influential on military efforts to increase the political saliency of programs like the ABM. Arguments dealing with

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strategic superiority over the Soviet Union, traditionally popular among the services, were reinforced by the "missile gap" experience and by the outcome of the Cuban missile crisis in 1962. American Presidents dealing with the ABM issue feared the possible political consequences of allowing the ballistic missile defense issue to be used as a basis for such a "gap." The Army's position on the ABM issue is indicative of the kinds of efforts which the military services have made in an attempt to secure political support for programs not approved by the executive branch of government, and provides examples of administration efforts to counter the political impact of such support.

II. The internal politics of the defense decision-making process. As indicated above, a part of a service's efforts to secure acceptance of its programs involves the marshalling of political support in the Congress and among the general public. However, most of the detailed debate, compromise, and allocative decisions in defense policy occur within the federal bureaucracy itself. The political and organizational aspects of bureaucratic decision-making have become topics of detailed study in recent years. Richard Neustadt's Presidential Power (New York: Wiley & Co., 1960) describes ways in which the nature of the federal bureaucracy acts as a constraint on executive policy choices. Other works which provide theoretical material relevant to bureaucratic decision-making include Charles E. Lindblom, The Intelligence of Democracy (New York: Harper & Row, Inc., 1965); Richard M. Cyert and James G. March, A Behavioral Theory of the Firm (Englewood Cliffs: Prentice Hall, Inc., 1963); and (of direct application to defense policy-related bureaucratic processes) Roberta Wohlstetter, Pearl Harbor: Warning and Decision (Stanford: Stanford University Press, 1962).
this internal process come forth in this case study as important variables influencing the general nature of defense decision-making. One such factor is the extent and strength of interservice rivalry, the competition among the military services for particular mission responsibilities and shares of the total defense budget. The second factor, related to the first, concerns the bureaucratic role of the civilian organizations within the Department of Defense.

During portions of the history of the ABM issue, the department acted more as an arbitrator than as a policy initiator, and the services' battles over funding in many instances became major public debates. In later years, Secretary of Defense Robert McNamara took a much more active role in formulating defense programs, with the result that interservice rivalry, while very much alive, was much less apparent to outside observers. The public defense policy controversies in this latter period were much more likely to reflect a civilian-military kind of split, and the services were somewhat less loath to support one another in debates with civilian officials.

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6 Heated interservice rivalries arose over many issues, and rapid technological progress yielded numerous new weapons. The services, realizing the budgetary and prestige implications of gaining authority for maintaining these complex new systems, fought over the various mission responsibilities involved. The strategic nuclear forces—both offensive and defensive—were prime targets for such controversy, and these debates have a colorful history. This case study documents one example of the competition, the Army-Air Force conflict over ABM responsibility. See Samuel P. Huntington, "Interservice Competition and the Political Roles of the Armed Services," in Henry A. Kissinger (ed.), Problems of National Strategy (New York: Praeger, 1965).

7 In the Secretary's words, "I see my position here as being that of a leader, not a judge. I'm here to originate and stimulate new ideas and programs, not just to referee arguments and harmonize interests." Quoted in Kaufmann, The McNamara Strategy, p. 171.
III. The evolution of American strategic thought and nuclear weapons planning. The character of the strategic weapons inventory of the United States is a function of the government's choice of strategic policy, its assumptions about the nature of nuclear war and the weapons required to deter or fight such a conflict. The early years of the nuclear age were characterized by the absence of workable strategic defenses in the United States, and subsequent expenditures for aircraft defense provided only a partially effective shield against nuclear attack. Defense strategists therefore emphasized the concept of deterrence as the basis of U.S. nuclear policy: Although extensive defense was impractical if not impossible if a nuclear attack occurred, security could nonetheless be maintained by the presence of strategic offensive forces capable of deterring potential aggressors. This philosophy was reinforced by the evolution of intercontinental ballistic missiles, and by early difficulties experienced by those who sought to create defenses against these weapons. The history of the ABM debate is in part a history of the impact of improving defensive and offensive nuclear capabilities upon strategic thinking, and provides a review of changing perceptions of the role of defensive systems in the deterrence strategy.  

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IV. Government decision-making on issues involving complex technology. The complexities of modern science have brought new problems to government, particularly in the area of obtaining expert advice on issues having major technological aspects or ramifications. The weapons which constitute the implementing tools of U.S. defense policy, in the strategic forces area in particular, tend to be complex, high-technology systems. In an effort to obtain competent technical advice on the feasibility and effectiveness of such systems, the U.S. government has taken a number of steps since World War II to bring scientific expertise to the center of government. This study includes discussion of a number of the institutions created in the Department of Defense and Executive Office of the President to provide such expertise, and documents the role which certain of the men appointed to positions in these institutions played in the ABM debate. Chapter Six is devoted in part to an examination of some of the problems which can arise when technical uncertainty leads to debate among scientific experts engaged in a political controversy.9

V. The impact of new techniques for systematic policy analysis on the decision-making process. The Defense Department under Robert McNamara brought the technique of systems analysis (alternatively called cost-benefit or cost-effectiveness analysis) to the center of the decision-making process, especially in the strategic forces area. By subjecting alternative weapon systems to detailed analysis through the use of models of nuclear war, the Office of the Assistant Secretary of Defense (Systems Analysis) introduced a rigorous kind of system performance comparison which then became an input into administration decisions on those weapons. This case study documents the manner in which the use of these techniques yielded changes in the kinds of arguments characterizing the ABM debate, especially within the Defense Department itself. ¹⁰

As an historical case study, this work has as its primary goal the analysis of the ABM debate and the U.S. government's policy decisions on the matter of ABM deployment. As the five general issues noted above indicate, this examination may be useful in a broader context than that of the ABM issue itself. The complexities of policy questions like the ABM issue require that both author and reader

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maintain an awareness of the kinds of considerations found in the literature cited in conjunction with the five issues described here. There is a feeling among some political scientists that studies of this type can be useful to decision-makers who must operate within the political process. Although this author is somewhat dubious as to the value of studies such as this as training devices for political officials, it is possible that certain insights might be gained, both by such officials and by political scientists, through this case study.

This study implies at least partial answers to a number of questions related to the defense decision-making process, answers based upon the specific events characterizing the ABM debate. These questions are not raised explicitly in the body of the case study, nor are the kinds of answers implied herein necessarily valid across a broad range of defense policy issues. However, it is useful to present a few of these questions, each of which relates to one or more of the general issues listed above, along with citations of those chapters in which the case study treats the issues involved in some detail:

Professor Richard Neustadt is a leading proponent of such a view, a view reinforced by President John F. Kennedy's response to Neustadt's Presidential Power (New York: Wiley and Company, 1960). Neustadt's book, a series of case studies on executive decision-making, was highly praised by the late President. The idea of using case studies to instruct professionals has a long history in law, business administration, and public administration programs in various universities.
I. What is the role of public opinion in the formulation of strategic weapons policy, and can an American political party repeat the "missile gap" type of campaign issue with success equivalent to the 1960 experience? [Chapters 2, 3, 7, 10 and 11]

II. What is the impact of interservice rivalry on defense decision-making, and what kinds of institutional and procedural circumstances within the federal government encourage or discourage such rivalry? [Chapters 2, 3, 5, 9 and 10]

III. What have been the major shifts in American strategic thinking in the 1960's, and how have these changes influenced the United States' acquisition of strategic weaponry? [Chapters 3, 4, 6, 7, 9 through 11]

IV. What has been the result of the institutionalization of expert technical advice in the federal bureaucracy, and how has such expertise interacted with non-technical judgments in the political process? [Chapters 2 through 4, 6, 8 through 10]

V. What has been the role of systems analysis in the defense policy process, and how have different types of analysis yielded different assessments of the utility of particular kinds of weapon systems? [Chapters 4, 5, 7 through 11]

These five questions deal with many of the factors which the author views as central to the understanding of the general nature of American defense policy and the processes by which that policy is made. By presenting information relevant to answering these questions, this study seeks to relate the single issue of the ABM to broader aspects of defense policy. The ABM debate has been a political debate, it
has been a strategy debate, and it has been a technical debate. Thus, the detailed treatments of such subjects as the role of the Congressional Armed Services Committees in the military budget process, the impact of alternative strategic warfare doctrines on nuclear force structure requirements, or the high-altitude weapons effects of nuclear warheads represent key aspects of this analysis.

If this study reflects a bias in its coverage of the ABM issue, it is its emphasis upon the activities of the civilian offices in the Defense Department. The roles of many other organizations, particularly the United States Army, the Air Force, and the President's Science Advisory Committee, are described herein, but generally in less detail than that found in analysis of the activities of the Office of the Secretary of Defense (OSD). This orientation exists for two reasons, one of which represents a major constraint upon case studies of this kind. First, it is the opinion of this author that OSD has in fact been the central actor in defense decision-making, at least since 1961. Therefore, it is not only proper but mandatory to emphasize the role of that organization in the ABM debate. Second, the unavailability of data relevant to the internal activities of organizations such as the military services can be a serious constraint. Both for reasons of security classification and because military assignment policies create rapid turnover of personnel in any given organization, information is difficult to acquire.

A NOTE ON SOURCES OF DATA

Policy debates which transpire within organizations are not often reflected in subsequent public presentations of such policy. As a result, the traditional data resources available to the policy analyst—newspapers, periodicals, and government documents such as Congressional testimony—do not often succeed in documenting extensively the nature of bureaucratic debate. This constraint on the researcher is partially overcome by a number of mechanisms. Certain specialists in the news media do obtain background information from governmental decision-makers concerning internal organizational conflict. This study makes extensive use of the data provided by military affairs reporters, news columnists who specialize in defense policy issues.

Congressional hearings also provide useful clues as to debates within the executive branch of government in those cases where probing by interested legislators brings forth such information from civilian and military officials. There is some problem for the researcher who utilizes such hearings, however, because key information, especially technical and intelligence data, is often deleted for security reasons. It is possible to obtain a portion of these types of information from yet another source, the aerospace trade journals, and these publications have been used extensively here. Given this author's desire to document in detail the history of the ABM debate as it occurred both publicly and within the federal government, it was necessary to utilize yet another major source of data: the decision-makers themselves.
A series of detailed interviews, approximately thirty in all, was conducted with individuals who participated in the ABM debate at various times and in a variety of capacities. Approximately one half of the interviewees were Defense Department and military officials, while the remainder included representatives of a number of federal and private organizations and groups. Because of the sensitivity of the information being dealt with, a technique equivalent to background press conference procedure was chosen. So as to adhere to academic standards of documentation, references to these interviews are included in the text as footnotes, and are coded by letter to insure anonymity of sources. This author recognizes responsibilities both to the academic community and to his interviewees, and welcomes any scholarly inquiry concerning sources of particular background data.

THE ABM ISSUE: A BRIEF INTRODUCTION

Before embarking upon the case study itself, it is useful to describe in brief the nature of the ABM issue. On September 18, 1967, Defense Secretary Robert S. McNamara announced that the United States would deploy a "thin" (small) ABM system designed primarily to defend this country against ballistic missile attacks from small nuclear forces, especially those of the Communist Chinese. Included as a major part of McNamara's speech was a further argument regarding the capabilities of ABM systems, an argument which viewed as futile any attempt to defend the U.S. population against the much larger (than the Chinese) Soviet offensive missile threat. While it included the decision to deploy an ABM, the speech was in fact an eloquent statement
of the Secretary's concern about strategic arms races and the status of world peace and security in light of such competition.

As a political issue, the ABM deployment question had floundered through many executive branch budgetary debates and Congressional hearings without any appreciable public attention. Although spawned in a time of crisis in strategic weaponry, i.e., the SPUTNIK days of 1957-58, early ABM proposals saw the system's parent, the U.S. Army, standing almost alone against major Defense Department and Executive Office opposition. The Army's specific system, the NIKE-ZEUS, was plagued by technical assessments which faulted its performance, and by strategic philosophies which doubted the utility of missile defense in general.

While relatively large blocks of funding were provided for ABM research and development between 1957 and 1962, the proponents of NIKE-ZEUS could not secure an administration commitment for even a limited deployment. Meanwhile, missile defense technology experienced an evolutionary process of improvement, such that new missiles, radars, computers, and deployment configurations became available. In 1962, a decision was taken by President Kennedy to push development of a new system which incorporated these changes. The new ABM, called NIKE-X, was born at a time when the United States was facing the serious political and strategic ramifications of a nuclear test ban treaty. The inability (which the ban would impose) to test nuclear weapons in the atmosphere created large uncertainties regarding estimates of ABM performance capabilities. Without live atmospheric nuclear intercept tests, assessments of missile defense potential were open to consider-
able debate.\textsuperscript{13}

As NIKE-X hardware moved from the blueprint to prototype stage, two strategic developments added fuel to the arguments of ABM supporters. The Chinese detonation of a nuclear device in late 1964 signaled a second serious, albeit unsophisticated, threat for U.S. strategic planners to consider. At the same time, it was becoming apparent that Soviet expenditures on strategic defensive systems were rising, and new ABM units were observed under construction in the Soviet Union. The decision about a U.S. ABM deployment had therefore to consider the additional complexities of not one, but two potential enemies, one of which might itself possess a significant ABM capability.

The early anti-deployment arguments made against the Army's NIKE-ZEUS were technical and budgetary: The system did not seem to perform adequately and was viewed as being much too costly. Reasonable levels of deployment required large investments both for the radar and computation gear of the ZEUS system itself, and for ancillary civil defense programs seen as necessary to complement the ABM batteries. These views were held by the majority of technical advisors within the Defense Department, and their critiques were adopted for use by the administrative officials charged with evaluating Army production

\textsuperscript{13}Current ABM systems utilize nuclear warheads in the interceptor missiles. The need to test the "kill radius" of such weapons against incoming ICBM warheads, plus the desire to make such tests as realistic as possible by using live nuclear ICBM warheads, generated the argument regarding the need for live tests.
requests. The advent of improved systems performance and the option of selecting smaller, less expensive levels of ABM deployment designed to counter less-than-massive offensive threats (such as the potential Chinese missile force) made these earlier objections to ABM less relevant.

However, a new argument of a strategic nature was generated against NIKE-X deployment in the mid-1960's. Many individuals concerned with the problem of U.S.-Soviet arms races in nuclear weaponry challenged the wisdom of altering the then-current strategic situation by deploying a U.S. ballistic missile defense. These opponents of deployment postulated that the Soviets would be forced to respond to a U.S. ABM, and a vicious cycle of move and countermove—a heightened arms race—would result. The debate within the American defense establishment polarized on this issue of whether or not it was reasonable to expect the Soviet Union to respond to a U.S. ABM deployment by increasing either (or both) Russian strategic offensive or defensive forces.

The years 1965 and 1966 saw the ABM debate characterized by this kind of rigid polarization between pro- and anti-deployment forces. Among the system's supporters were the Army, many defense contractors, the Joint Chiefs of Staff, many members of defense-related Congressional committees, and a growing contingent of Defense Department technical staff officials. While this array of groups and individuals differed as to the size of deployment which they viewed as satisfactory, they were united in the belief that some kind of ABM system should be produced.
Those who opposed deployment included the Secretary of Defense himself, a number of OSD non-technical staff personnel, and a large and diverse group of civilian scientists, both in and out of government. These anti-ABM forces were also distributed along a spectrum of opinion ranging from those who viewed any move toward strategic defense as unacceptably destabilizing vis-a-vis the strategic arms race to those who, while accepting the utility of small ABM deployments in certain circumstances, opposed the production of any new systems on the grounds that such a "foot in the door" would lead to immense—and in their view, futile—levels of expenditure for "full" ABM protection.

Because of increased Congressional clamor, accelerated Chinese strategic weapons development, rising uncertainty regarding Soviet ABM work, and growing differences between the Joint Chiefs of Staff and Secretary McNamara over Vietnam policy and other issues, the deployment issue came to a head in the last months of 1966. In January of the next year, President Johnson announced that he would provide pre-production money so as to allow procurement of a "thin" ABM system to begin in fiscal 1968. The release of such funding was made contingent upon whether or not American diplomacy succeeded in bringing the Soviet Union to the conference table to discuss the limitation of strategic weapons production. The discussions between the President, Secretary McNamara, and Soviet Premier Alexei Kosygin at Glassboro, New Jersey in June, 1967, were an unhappy culmination to months of U.S. efforts aimed at eliciting Soviet agreement to negotiations concerning such limitations.
Proponents of U.S. ABM deployment gained another ally in the spring of 1967. OSD analysts examining the strategic situation vis-a-vis the Soviet Union recommended to McNamara that an ABM system was the most advantageous means by which the United States could insure continued low vulnerability of its land-based ICBM force. The MINUTEMAN force, while basically secure from Soviet attack at the time, was deemed to be in some danger in the future owing to a possible increase in numbers and accuracy of Soviet offensive missiles. Deployment proponents thus gained a further justification for ABM procurement. Not only could a thin (and comparatively inexpensive) system limit the Communist Chinese ability to inflict damage on the United States through ICBM attack, but such an ABM could also be designed to defend America's own land-based offensive missile force.

Secretary McNamara's September 18 speech was indeed controversial, and its tone and content reinforced the ongoing debate concerning the desirability of ballistic missile defense. Although production of an ABM system had finally been approved by the United States government, the debate was far from finished. From late 1967 through the date of this writing, protagonists in the debate have continued to make the issue one of major national significance. In early 1969, President Richard Nixon, like three Presidents before him, found his administration faced with serious opposition concerning ABM policy. Although this study carries its analysis of the issue only through September, 1967, the debate continues. While those who have formulated specific positions regarding the value of ABM deployment will undoubtedly
continue to question the desirability or even the accuracy of certain positions voiced in the debate, it is hoped that the rationales behind the relevant policy choices will become more evident. By documenting the nature of the decision-making process, this analysis seeks to indicate the reasons for these important decisions.
CHAPTER II
ABM BECOMES AN ISSUE IN AMERICAN DEFENSE POLICY

EARLY PERCEPTIONS OF THE GUIDED MISSILE THREAT

While reflection on the birth of the guided missile threat to the United States usually conjures up images of the post-Sputnik days of the late 1950's, American interest in such weapons, and possible defenses against them, began much earlier. Between 1944 and 1945, some 3600 German V-2 ballistic rockets were launched against allied targets in Europe. The threat from this relatively simple yet terrifying precursor to the modern ICBM quickly generated interest in this country as to means of defense against such attacks.

The Army Air Force in 1946 let two study contracts designed to generate ideas as to how to stop V-2 type threats. The two programs which resulted, General Electric's Project THUMPER and the University of Michigan's Project WIZARD, were at once both optimistic and pessimistic regarding the feasibility of ABM systems. As a specific threat, the V-2 weapon posed almost insurmountable technical problems for the defense. The combination of a short (five minute) flight time and flat trajectory so compressed the time frame available for detection and interception that current (late 1940's) missile and radar technologies proved woefully inadequate.

1"Ballistic Missile Chronology," Aviation Week, Vol. 65, August 6, 1956, p. 105.
Analysis of the characteristics of longer range ballistic missiles, weapons whose trajectory made detection possible at extended range, indicated that current or foreseeable radar and interceptor technology could conceivably be integrated to provide some degree of defense. The Air Force continued to fund THUMPER and WIZARD through 1949, when the former project was integrated into the latter.\(^3\) By this time, the Air Force was a separate service, and the seeds of a potential interservice rivalry between the Army and Air Force were present.

The Army had been in the air defense business for some time, both through its then subsidiary Air Force branch and through other programs. During the same years that the V-2 threat generated THUMPER and WIZARD, the Army contracted with the Western Electric-Bell Telephone Laboratories consortium for the design and development of a ground-to-air anti-aircraft missile system. The result of this latter program was the NIKE-AJAX system, which was later deployed to meet the threat of enemy bomber attack. Although the Air Force continued to fund WIZARD, and the Army NIKE-AJAX program resulted in technological progress in both missile and radar components, the absence of a serious missile threat from abroad served to temper American development of ABM systems.

A 1946 Army study group, the Stillwell Board, had developed an ABM requirement and suggested that immediate efforts be made to develop such a system. A technical briefing on possible programs was presented by Army research personnel to their Chief of Staff, Dwight D. Eisenhower. The

\(^3\)Peck and Scherer, Appendix 12A.
issue quietly faded from view for a time. The Soviet detonation of an atomic bomb on September 22, 1949, did lead to a series of reevaluations of American defense capabilities, but the perceived danger was one of Russian bomber attack, and the ABM idea remained dormant.

THE EVOLUTION OF NIKE-ZEUS

During the early 1950's, the Army began to replace its first-generation anti-aircraft missile, the NIKE-AJAX, with the more sophisticated NIKE-HERCULES, a larger, faster, and more accurate nuclear-tipped interceptor missile. In 1954, Johns Hopkins University's Operations Research Office received an Army contract to study the anti-aircraft and ABM possibilities for the late 1950's. Over three years in the making, the ORO report, "The Defense of the United States Against Aircraft and Missiles," attempted to provide a comprehensive analysis of the active defense environment. While this study was still in progress, the Army asked its ongoing air defense systems contractor, Bell Telephone Laboratories, to

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4 Interview A.
5 The conception of U.S. aircraft defense systems and the modifications in strategic thinking associated with the idea of early warning constitute fascinating defense policy case studies themselves. For a brief review of the key studies leading to the SAGE and DEW Line systems, see "Stiff Fight Brews on Air Defense," Aviation Week, Vol. 59, November 23, 1953, pp. 16-17.
conduct an intensive ABM feasibility and design study. Completed in September, 1956, this report concluded that development of an ABM was indeed feasible.

A review of the Bell Labs effort is useful in describing the then current state of the art in ABM technology. The successful development by Bell-Western Electric of the NIKE-HERCULES led to hopes within the Army that this missile or a modified version of it could provide the basis for a feasible ABM. Improved thrust capability from certain solid propellants and the development of a new thrust-vectoring method represented significant breakthroughs in the 1955-56 period. With these modifications integrated into the basic design of an improved NIKE-HERCULES, the NIKE-ZEUS, the first ABM missile, was born.

The existence of a seemingly feasible interceptor missile in the form of NIKE-ZEUS, while important, did not solve the more complex technical problems of detection, tracking, and interception guidance. A major constraint imposed by prior technology, that of radar range and power, was gradually being overcome. Extensive development of existing Klystron concepts yielded significant increases in radar detection range and tracking accuracy. Signal reception in the ZEUS acquisition radar

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7Peck and Scherer, p. 233. See also "A Discussion of NIKE-ZEUS Decisions," Draft of a speech by Mr. Fred A. Payne, Deputy Director of Defense Research and Engineering (Strategic and Defensive Systems), delivered to a meeting of the Brookings Institution, Washington, D.C., October 1, 1964. (Hereafter referred to as "Payne Speech"). See p. 3.

8Peck and Scherer, p. 335. The following discussion is heavily indebted to the published excerpts of the NIKE-ZEUS Case Study compiled by the Harvard Business School's Weapons Acquisition Study. (See Peck and Scherer, pp. 233-34.)

9Ibid., p. 233. Klystron tubes, the basic electronic components which determine radar power, attained energy levels in the multi-million watt range at this time. As a result, radar ranges improved in this period from approximately 100 miles to over 300 miles.
unit was strengthened through the first large-scale use of Luneberg lens technology, first developed in 1944. Finally, Bell Laboratories created a new, extremely high-speed data-processing system—a prerequisite for an adequate ABM tracking-guidance system—based upon that facility’s own technological milestone of 1948, the transistor. Bell's successful integration of these various technical improvements into a comprehensive ABM design proposal prompted the Army in late 1956 to approve funds for the development of the NIKE-ZEUS system.

THE POLITICAL AND STRATEGIC ENVIRONMENT: 1952-1956

The Army's progress in developing understanding and hardware for an ABM effort did not evolve in a political or strategic vacuum. It is useful to describe here certain characteristics of the environment surrounding the ABM issue in these particular years. Two areas of particular importance were the Army-Air Force rivalry in strategic weaponry and the Eisenhower administration's efforts to resolve basic controversies, both philosophical and bureaucratic, surrounding American nuclear strategy and weapons procurement policy. The combination of these two circumstances constituted an interesting preliminary to the full-fledged strategic debate surrounding America's post-Sputnik defense policy.

The fact that the Air Force, in addition to the Army, had been working on ABM has already been mentioned. The Air Force's WIZARD study, competing as it was head to head with the Army's series of NIKE systems, was at a distinct disadvantage in that the latter service actually possessed

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10 Ibid., p. 234.
some operational hardware. Partially as a result of growing awareness of the Soviet bomber threat, and partially because the Air Force felt current (early 1950's) ABM technology to be operationally ineffective, that service channeled the results of WIZARD and its predecessor, THUMPER, into a long-range anti-aircraft system, BOMARC.¹¹ In 1955, however, the Air Force again entered the ABM business by contracting with Convair for a system design-development study, also called WIZARD.¹² This program was later expanded to include three contractor teams (Convair-RCA, Lockheed-Raytheon, and Bell Labs-Douglas), each given the task of generating a complete ABM system proposal.

In addition to competing in defensive systems development, the two services were coming to clash more directly with regard to offensive guided missile systems. While the Army had benefited greatly by its acquisition of Dr. Werner Von Braun and his team of former German scientists who had developed the V-1 and V-2 during the war, the Air Force was developing close ties with aerospace firms desirous of landing the lucrative contracts expected to evolve from missile development.¹³ ABM, then, was only one part of an Army-Air Force controversy which was to grow through the 1950's.


¹² Peck and Scherer, Appendix 12A. This program was unrelated to the earlier University of Michigan study of the same name.

The first five years of the Eisenhower presidency also found the United States growing increasingly concerned as to the proper policies to be chosen regarding nuclear weaponry. The uncertainties associated with assessing the nature of the Soviet threat and the budgetary implications of potential major new expenditures for strategic offensive and defensive weapons exacerbated the problem of interservice rivalries. President Eisenhower had difficulties in obtaining disinterested advice as he attempted to evaluate the plethora of proposals for alternative strategies and weapons brought forth by the situation. In 1955, Eisenhower called together a group of civilian scientists to provide him with an independent assessment of the nation's strategic status vis-à-vis the U.S.S.R. and advise the administration on possible new weaponry. Chaired by M.I.T.'s Dr. James R. Killian, the Technological Capabilities Panel, as the group was called, warned that Soviet progress in ICBM development would give that nation a "decisive" missile lead by 1960 if the United States did not conduct a major program to develop such weapons itself.\textsuperscript{14}

The Killian recommendations, while resulting in greater attention to the infant U.S. ICBM program, did not prompt a major White House budget response. At the same time, however, another aspect of the Soviet threat—one relevant not to 1960 but to the current time—had yielded a major U.S. effort in strategic weaponry. The U.S.S.R.'s strategic bomber force posed a threat which to date represented the only operational nuclear force capable of inter-continental attack on the United States. As an outgrowth of another government-sponsored

\textsuperscript{14}See Huntington, p. 89; and Skolnikoff, p. 227.
study group. Project Charles, the Air Force had initiated development and deployment of the SAGE system, a comprehensive detection-interception system for defense against manned bombers. The Army, itself seeking a major share of the mission responsibility for air defense, took its plan for R&D funding of its proposed NIKE-ZEUS ABM system to the Congress in mid-1956. Already funding large outlays for SAGE, the administration faced a new issue. Should an ABM be constructed as a part of the U.S. strategic force structure, and if such a program was desired, which service should build it?

THE ISSUE EMERGES: ABM IN THE SPUTNIK ERA

Army presentation of the NIKE-ZEUS development proposal to Defense Secretary Charles Wilson in November, 1956, brought the question of service roles in ballistic missile defense to the highest level in the Defense Department. On November 26, 1956, the Secretary ordered that the ABM mission be separated into two sections and shared by the Army and the Air Force. The former was responsible for "point defense" systems, while the latter was to develop "area defense" weapons. While Wilson's ruling may on the surface seem specific enough to have terminated the

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15 For a general discussion of the origins of the SAGE system, see Charles M. Atkins and Edward R. Jayne II, "A Successful Laboratory and Science Policy: The Lincoln Case," Department of Political Science, M.I.T., January 30, 1967 (mimeo.), especially Chapters 2 and 3.

growing NIKE-ZEUS-versus-WIZARD rivalry, such was not the case. The 
presence of high uncertainty regarding ABM performance permitted both 
services to back the merits of their own plans while questioning the 
feasibility of the concepts argued by the other side. The actual result 
of the separation of missions was that the Army labeled ZEUS as a point 
defense system and the Air Force described WIZARD as a long-range area 
defense. Little else in the debate changed.

The first nine months of 1957 found ABM generally in the background, 
even within the Defense Department itself. The Army, while continuing 
its ZEUS development program, found that the absence of an operational 
ICBM threat to the United States made it difficult to generate support 
for an ABM system.\(^{17}\) The Air Force, meanwhile, was content to let 
WIZARD continue as a general research effort, and did not press its con-
tractors for actual component designs.\(^{18}\) That service, heavily involved 
as it was with the new SAGE air defense system and the design of a 
ballistic missile early warning system (BMEWS),\(^{19}\) placed little emphasis 
on ABM. A DOD committee headed by Dr. Hector Skifter did review the ABM

\(^{17}\)The Army had initiated a second ABM program in 1955, this time 
designed to provide a mobile protection for ground forces. Designed by 
Cornell Aeronautical Laboratories, the PLATO system was to use components 
of the proposed NIKE-ZEUS. Because it could not generate sufficient DOD 
support for the effort, the Army was forced in the summer of 1957 to 
cancel (although only temporarily) its R&D plan for PLATO.

\(^{18}\)The Air Force sought an extremely long-range (1000 miles) system, 
and RCA's development of extended range radar was seen to be the key to 
such an "area defense" system. See "Lack of Interest Stalls Missile 

\(^{19}\)See Atkins and Jayne, Chapters 2 and 3.
issue in April, recommending to Deputy Defense Secretary Donald Quarles that the Army continue its study and design work on ZEUS and that the Air Force be given the go-ahead on construction plans for BMEWS.\textsuperscript{20}

Also in the Spring of 1957, the Federal Civil Defense Administration submitted to the National Security Council a proposal calling for a federal expenditure of $40 billion over a period of several years for construction of blast and fallout shelters for the U.S. population. After NSC discussion of the recommendation, President Eisenhower ordered a study to be made by a special ad hoc group of private citizens, a study which was to examine both the FCDA plan and possible alternative defense uses of increased budgets, including active defenses.\textsuperscript{21} The eleven man committee, headed by RAND Corporation board chairman H. Rowan Gaither, included a number of well-known experts in both nuclear strategy and weapon systems evaluation. The group conducted its work, centered upon detailed technical studies and subsequent committee assessments of these preparations, throughout the summer and fall of 1957.\textsuperscript{22}

\textsuperscript{20}Payne Speech, p. 4.


\textsuperscript{22}Ibid., pp. 360-63. The actual Gaither Report has never been made public, but Halperin's study provides a detailed compilation of publicly available information on the group and its findings. Among the eleven members were three individuals in particular who would come to play important roles in future debate on the ABM issue: William C. Foster (former Deputy Secretary of Defense and later to become Director of the Arms Control and Disarmament Agency), Jerome B. Wiesner (who would become President Kennedy's Science Advisor), and Hector R. Skiffter (later to become Deputy Assistant Secretary of Defense (R&D) for Air Defense).
Just as the Gaither committee was readying its formal report for the President, the Soviet Union shook the world with its launch of the first two artificial earth satellites. It was in the post-Sputnik environment of doubt and uncertainty that the Gaither Report was presented to President Eisenhower at an NSC meeting on November 7, 1957. The crucial problem facing the security of the United States, in the report's view, was the vulnerability of the American strategic bomber forces. In the short run, the Gaither group called for increased alert and dispersal of the bombers. Over the longer term, increased IRBM and ICBM programs were recommended. As for population defense, the report gave a low priority to shelter plans, calling only for a modest R&D effort in this area. Any major resource commitments beyond those required to implement the "offensive invulnerability" priorities would be best spent, in the committee's view, strengthening the nation's capabilities to fight conventional wars.23

At a time when the administration was faced with major criticism regarding apparent Soviet superiority in modern weapons technology, the President had received a detailed argument for new programs for defense. Among the subjects dealt with by the Gaither report was ballistic missile defense, but supporters of the Army's NIKE-ZEUS made only limited gains toward making ABM a salient national security issue within the government. The Gaither report did suggest that a significant research effort be made to investigate means of active defense against ICBMs, but it in no way recommended actual production of ABM systems based upon current

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technology. While the defense community did begin to examine ABM concepts to a greater extent than had previously been done, such emphasis must be placed in an accurate perspective with regard to the kinds of recriminations that shook the United States in the weeks and months following SPUTNIKs I and II.

The manner in which the administration reacted to the Gaither report represented an important determinant of the extent to which SPUTNIK generated support for NIKE-ZEUS. In many ways, the report was a major challenge of President Eisenhower's national defense policies. Furthermore, the ad hoc status of the Gaither group left the recommendations without any noticeable institutional support within the federal bureaucracy. Thus, the committee's detailed plans for improved deterrent capability and increased population defense were only partially translated into actual policy, and then only after considerable Congressional prodding. Even had the Gaither recommendations been accepted by the administration, it is doubtful as to just how much funding could have been allocated to ABM development. The offensive side of the strategic force structure was the focus of the report's attentions, and both the Air Force and Army placed numerous priorities above ballistic missile defense.

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24 Interview F; Ibid.
25 Halperin, pp. 369-73. This study provides a detailed examination of the problems underlying administration implementation of the Gaither recommendations.
26 Ibid., pp. 372-73. For the Army, the paramount objective associated with the Gaither study concerned improved conventional land forces capable of fighting limited wars. Army hopes for support of that service's IRBM program placed still another priority ahead of production plans for NIKE-ZEUS.
Although Eisenhower and his new Secretary of Defense, Neil McElroy, showed little inclination to accelerate current ABM programs, lower echelons within the Defense Department were continuing to examine the utility of such defenses. In October, 1957, DOD received a specific piece of strategic/technical analysis which served to structure much of the ensuing administration discussion of ABM systems. Basing its recommendations upon many of the same judgments concerning strategic force requirements underlying the Gaither report, the RAND Corporation presented an examination of the technical capabilities and possible strategic roles of current missile defense designs. The central conclusion of the study was that, for a number of reasons, the most attractive deployment configuration for an American ABM system would be as a defense of U.S. Strategic Air Command bases. Such a deployment would, by guarding the strategic bomber force, "protect SAC's status as a deterrent to aggressors."  

The RAND assessment of the ZEUS and WIZARD concepts was that, the services' claims to area defense capabilities aside, current ABM technology limited any deployment to point defense configurations. Such a constraint is easily understandable in technical terms. If an incoming ballistic missile warhead, traveling at speeds in excess of 15,000 miles

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27"Funds Preclude ICBM Defense for Cities," Aviation Week, Vol. 67, October 14, 1957, p. 37. The quote is taken directly from the RAND study.

28Ibid., "Current" technology referred to the NIKE-ZEUS interceptor and the Bell Laboratories 100-200 mile range radars. While longer range radars were available (See footnote 18), Bell Laboratories resisted Army efforts to switch from the Lab's own shorter range system to that of RCA or General Electric. See "Lack of Interest Stalls Missile Defense Programs," Aviation Week, Vol. 67, October 7, 1957, p. 29.
per hour, could not be detected until it was within 300 miles of an ABM radar, the time between detection and warhead arrival over the defended site is compressed to one minute or less. Even an extremely high-acceleration ABM missile—and the early ZEUS was not such a system—could not hope to perform an interception at any altitude above 50-75 miles.\footnote{The time constraint is also highly sensitive to the speed of the detection-tracking-command guidance sequence which must be performed by the ABM computation system. Early technology in this area was such that this time factor represented a serious problem.}

A given ABM installation, then, could not afford protection to any more than a small area of territory. Such a system provided, in terms of earlier definition, a \textit{point} defense.

The RAND study, perhaps in part because the organization had strong ties to the Air Force and also because WIZARD offered the greater promise of an area defense, argued that the Air Force system was technically ahead of NIKE-ZEUS.\footnote{WIZARD contemplated using extremely long-range (800-1000 miles) radars similar to those developed for BMEWS by RCA and General Electric. See Atkins and Jayne, p. 14. For an account of the RAND conclusions, see Richard Witkin, "Missile Defense in Cities Doubted," \textit{New York Times}, October 28, 1957. A history of the RAND relationship with the Air Force is found in Bruce L. Smith, \textit{The RAND Corporation} (Cambridge: Harvard University Press, 1966).} The report also discussed the problem of ABM radar discrimination, i.e., the capability of the defensive system to identify the incoming warhead if and when the weapon was accompanied by other objects (decoys, booster sections, etc.) discernible by the radar. Also raised was the possibility of radar blackout or interference due to such things as aurora borealis, electronic jamming, and nearby nuclear detonations. The questions of decoys and discrimination, while seeming to have little impact in late 1957, were to become central and controversial issues in the ABM debate of future years.
In fact, DOD engineers had themselves realized the serious implications which the development of effective penetration aids would have upon current ABM concepts. At about the same time the RAND study was released, Guided Missiles Director William Holaday created a technical committee, the "Reentry Body Identification Group," to study the issue. Headed by William E. Bradley, the committee submitted an initial report on January 30, 1958. Central to the conclusions of this document was the assessment that offensive penetration aids such as decoys, chaff, booster fragments, multiple warheads, small radar cross sections for warheads, and nuclear blackout were indeed feasible.31

Population defense, the mission which the Army was destined to push as the central role of the NIKE-ZEUS and follow-on ABM systems, was viewed by RAND and others to be impossible at this time. A ZEUS-type system, because of its limited range, would require a phenomenal number of units to defend the urban population of the United States. This economic argument against the ZEUS was reinforced by a pessimistic assessment of individual ABM missile performance. The estimated kill probability (KP) of a single interceptor, i.e., the composite assessment of the missile's reliability, accuracy, and warhead power, was so low as to require some ten to twenty ABM's to be fired at each incoming warhead in order to insure an acceptable overall KP. Thus, a single ABM battery, even if equipped with 50-100 individual ZEUS missiles, could defend only a small piece of territory, and could defend it with high reliability against only a few incoming warheads.

DEFENSE DEPARTMENT INTERCESSION: A RIVALRY QUELLED

While technical assessments did nothing to enhance the image of ABM systems, the post-SPUTNIK political environment saw both the Army and Air Force increase their efforts to elicit funding for their respective development programs. The Eisenhower administration, in an attempt to quiet this debate, asked for detailed progress reports on ABM from the two services.\(^\text{32}\) In accordance with the Eisenhower effort to spur the military weapons development process while curbing potentially harmful interservice quarrels, Defense Secretary Neil McElroy disclosed plans to appoint a "single manager" at the Defense Department level who would head all service development projects for strategic systems.\(^\text{33}\)

Faced with this rather explicit evidence that the ABM question was about to be dealt with directly by the Defense Department, the two services took predictable steps to strengthen their positions. The Air Force, realizing that WIZARD—without any hardware to show for itself—was likely to come out a poor second to NIKE-ZEUS if the choice were to be made soon, began to attack the feasibility of ABM's in general. Such a position was not difficult for that service to justify, for two reasons. First, American strategic thinking has historically been oriented toward the offensive; indeed, the Eisenhower-Dulles philosophy of massive retaliation was based in part upon a reluctance to make continued and


extensive expenditures for strategic defenses. Second, the most salient strategic issue which came out of the U.S. reaction to SPUTNIK was the demand that this country too must develop an operational offensive missile force. Using the kinds of arguments generated by the RAND study, the Air Force indicated that defense dollars would be better spent in the offensive forces portion of the budget.

The Army, realizing that their NIKE-ZEUS had a definite edge over WIZARD in that the former was able to put an actual system design on the table, increased its efforts to bring about DOD funding of their deployment plan. Three quite persuasive and vocal generals led this campaign: Army Chief of Staff Maxwell Taylor, R&D Director James Gavin, and Chief of the Redstone Arsenal H. N. Toftoy. General Taylor presented to the Joint Chiefs of Staff and Secretary McElroy a complex NIKE-ZEUS deployment plan calling for a $6 to $7 billion expenditure to produce a system which would become operational in 1961. This proposal, reinforced by public statements by Toftoy and Gavin, brought the issue directly before the Secretary and the President.

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34 Although there were a number of reasons behind the massive retaliation theory's dependence upon strategic nuclear forces, the higher-than-anticipated costs and lower-than-expected effectiveness of the Eisenhower-built SAGE bomber defense network contributed to doubts concerning the utility of strategic defense.

35 James Reston, "Army Plan Seeks 6 Billion to Make a Missile Killer," New York Times, November 20, 1957. The offensive missile mission was still a major point of contention between the Air Force and the Army, and the Air Force sought to strengthen its position in that struggle.

36 Ibid.

The Army's claims that NIKE-ZEUS was "in being" and the degree of urgency which General Taylor implied brought quick responses from both the Air Force and Secretary McElroy. A policy paper prepared for the Joint Chiefs by the Air Staff disputed the Army presentation, arguing that NIKE-ZEUS was not advanced enough to warrant such huge expenditures. The critique went on to argue that an over-emphasis on defensive weapons was part of a "Maginot Line" conception, "which has never worked in history." 38

McElroy's response was equally critical, although for quite different reasons. The Secretary chastised Taylor for trying to blow the issue out of proportion to its significance, and chided the New York Times' James Reston for using the term "dramatic" to describe the plan. McElroy went on to argue, as the Air Force had, that NIKE-ZEUS was by no means ready for deployment. In his words, "there is a great deal we need to know in terms of development before there can be any such program." 39

Quite salient to the civilian and military participants in this particular exchange was the question of who was to control the ABM development program; both the Army and the Air Force resented the idea of civilian control of such operations. Indeed, General Taylor's entire presentation to the JCS and McElroy may be viewed as an effort (apart from the interservice rivalry issue) to modify the earlier DOD view that the program should be civilian-run. However, President Eisenhower seemed quite


39 Ibid.
intent upon removing all pre-production weapons work from direct service control. Such a policy sought to avoid the kind of interservice strife that had grown commonplace in an era of rapid technological change. By December of 1957, the issue seemed closed; 1958 would see ABM, looking basically like the Army version, come under some kind of direction by a civilian organization.

By this time, the intricacies of the guided missile-versus-ABM problem were coming to be discussed by a growing number of general media publications. This discussion too was polarized between pro-Air Force and pro-Army views, and arguments which were to be part of the debate for years to come began to emerge. It remained for the Eisenhower administration, already beleaguered by the SPUTNIK challenge to America's technological prowess in general, to deal with the specific problem of ABM: How was the program to be administered, and what level of resource commitment was deemed to be satisfactory?

POLITICAL SUCCESSES AND TECHNICAL DOUBTS: CONGRESS TAKES INTEREST

In his 1958 State of the Union Address, President Eisenhower announced what the services had feared: All ABM research and development was to come under the direction of a new single civilian agency within the Department of Defense. Congress was asked to approve the creation of such an agency.

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which was given the title of Advanced Research Projects Agency, or ARPA. In the interim, the Defense Department took two major steps regarding the Army-Air Force debate. First, Secretary McElroy modified Charles E. Wilson's ABM Policy Statement of November, 1956. Wilson had separated responsibilities for ABM systems between Army ("point defense") and Air Force ("area defense") in a rather futile attempt to quell the growing rivalry. McElroy's policy was much more specific: The Air Force was ordered to concentrate on WIZARD's radar and data handling aspects, while the Army was to go forward with the NIKE-ZEUS system with the goal of demonstrating operational feasibility. 42

The second DOD action was to place top responsibility for all ABM development—until ARPA was formally created—in the hands of the Director of Guided Missiles, William M. Holaday. 43 While these two moves by McElroy were designed to quiet the ABM issue somewhat, his efforts were unsuccessful. In fact, the opposite held true. The Army, sensing victory in its efforts to win deployment funding for NIKE-ZEUS, pressed even harder for such an allocation. Realizing that an increase in Army funding probably meant, under the Eisenhower defense budget "ceiling" approach, a corresponding reduction in Air Force programs, the latter service also


rejoined the fray. In the process, the services found sympathetic ears in an institution which had previously been rather quiet on the issue—the Congress.

Confronted with a situation in which the nation's defense policies, programs, and administrative structure were experiencing rapid modification, the House and Senate attempted to come to grips with a wide range of defense issues. While questions of technological prowess, civilian versus military administrative control, and overall funding levels were discussed most prominently, ABM managed to command a significant amount of congressional attention. The resulting testimony and debate on the issues involved with ballistic missile defense provide an accurate characterization of an argument which was to continue for years to come.

As a response to the perceived national security crisis which SPUTNIK had generated within the United States, the Armed Services Committee of the House of Representatives instituted a two-month session of hearings entitled "Investigation of National Defense Missiles." These deliberations, preceded as they were by the DOD policy shift on ABM cited above, became a focal point for charges by Army and Air Force officials regarding their views of the proper means of attaining an ABM capability. The tone of these presentations, from the Army viewpoint especially, was previewed earlier in January, 1958, as an effort was made to convince the

44 For discussions of the 'ceiling' approach, see William W. Kaufmann, The McNamara Strategy, pp. 27-28; and Samuel Huntington, The Common Defense, pp. 223-225.

Congress to authorize immediate deployment of NIKE-ZEUS.\footnote{Donald Douglas, President of Douglas Aircraft, had told the Senate Preparedness Subcommittee that NIKE-ZEUS was ready to deploy, and he blamed "the maze of committees and layers at the Pentagon for delay and indecision" in weapons procurement. See L. E. Prina (quote is Prina's), "ZEUS Weapon Tieup Charges to Pentagon," \textit{Washington Star}, January 17, 1958. Army officers stumped the banquet circuit appealing for deployment also. See, for example, the comments of Army Major General Robert J. Wood at Fort Myer, Virginia, quoted in "Anti-Missile Work Noted," \textit{Baltimore Sun}, January 23, 1958.}

The House Armed Services Committee investigation, chaired by Representative Carl Vinson, began with an elaboration by Defense Secretary Neil McElroy of the rationale behind the January 18 decision to curtail Air Force work on WIZARD and place all ABM R&D under the soon to be created ARPA. Because the directive in question referred only to ABM development, and because both the Army and Air Force had sought to secure operational responsibility for such weapons through logical extensions of their individual service doctrines, the committee sought to clarify which organization would finally be chosen to operate an ABM system. Testimony by both McElroy and his Deputy, Donald Quarles, indicated that such clarification was not yet possible, because the actual configuration of a future ABM system and the relationship of such a deployment to the rest of our air defense network could not yet be determined.\footnote{Investigation, p. 4068 (McElroy statement), and p. 4094 (Quarles testimony).}

Members of the committee demonstrated significant interest in the physical form and technological status of the NIKE-ZEUS and WIZARD. Army testimony described that service's ABM as a system which utilized four types of radar for each battery: A forward acquisition, acquisition (later
called "discrimination"), target track, and missile track radar. The ZEUS missile itself was at the time only in the mock-up stage at Douglas Aircraft, but rapid development of all system components was seen to be possible, given adequate budgetary support. General Daley, director of the Army ABM program, argued that "the ZEUS development is on high priority and we believe that a significant capability could be gotten against ballistic missiles by 1962 if deployment is accelerated."

What the Army had in mind was a "crash" program for deployment of the NIKE-ZEUS system. This plan, presented in mid-January to the Assistant Secretary of Defense for R&D, indicated that two years could be cut from the "normal" plan (initial operating capacity in 1962 instead of 1964) if an additional $136 million was made available to the Army not later than April 1, 1958. This money would be utilized for pre-production tooling and for procurement of long lead-time items (transistors and other components), expenditures not otherwise anticipated until after the current development program was complete.

Impressed by the Army presentation, Chairman Vinson drafted a letter to Secretary McElroy, indicating the following points: (a) The committee agreed with the DOD directive canceling the missile portion of WIZARD and emphasizing ZEUS; (b) Operational responsibility for ABM should now be

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48 The Army by this time had accepted the utility of the Air Force-developed surveillance radars. An Aviation Week article ("USAF, Army Divide Anti-Missile Task," January 27, 1958, p. 26) cites the forward acquisition radar range as 1000 miles and that of the acquisition radar as 600 miles.

49 Investigation, p. 4235.

50 Ibid., p. 4264.

assigned specifically to the Army so as to avoid further rivalry; and (c) The Army crash program should be approved. Summarizing his position, Vinson wrote: "I must conclude that the expenditure of this additional sum is warranted and that a decision to this effect should be made at the earliest practical date." 52

The Army had seemingly won a clearcut victory. Their program, with its hardware further developed than WIZARD's, was well received by a group of congressmen undergoing a detailed learning process regarding missile technology. The Vinson letter offered a specific solution to Mr. McElroy's dilemma concerning the assignment of operational responsibility for the missile defense mission, a solution which could in the long run represent the addition of more than $6 billion to the Army's share of the defense budget. As the hearings continued, the Army announced a technological breakthrough in ABM command guidance equipment which resulted from work performed in Project PLATO, the mobile ABM system plan. 53 As the Air Force came to testify before the committee, proponents of NIKE-ZEUS had considerable ground for optimism.

The Secretary of the Air Force, James H. Douglas, included in his opening presentation a quite different interpretation of the January 18 policy ruling by OSD than that offered by Army Secretary William Brucker. Douglas saw the ruling as "limit(ing) the Army authority rather narrowly to the missile system" portion of ABM development. 54 He went on to argue

52 Investigation, p. 4723.

53 Mark S. Watson, "'Tremendous' Anti-Missile Step Taken," Baltimore Sun, February 12, 1958. Watson, military staff writer for the Sun, became one of the press' most consistent supporters of the Army's ABM deployment plan. His columns generally reflect an accurate view of current Army thinking on the ABM issue.

54 Investigation, p. 4723.
that ballistic missile defense, involving as it did complex missile and radar systems, was quite comparable with previous Air Force programs and experience. As the Congressmen turned to specific questions regarding the Air Force view of ABM, the Secretary turned the floor over to his Deputy Chief of Staff for R&D, Lt. General Donald L. Putt. Putt's presentation and the ensuing discussion were to have a notable impact on the committee's assessment of the relative merits of ZEUS and WIZARD.

Asked to evaluate the Army program specifically, the Air Force General replied that:

We have in the Air Force grave concern as to the capability of ZEUS, for the cost involved....If the Air Force had the operational responsibility and the development responsibility, it would not develop the NIKE-ZEUS system, for immediate operational deployment.55

Defending this view, Putt argued that, of the three ABM system designs generated by WIZARD, the Bell Laboratories-Douglas Aircraft plan (essentially equivalent to NIKE-ZEUS) showed the least promise of all. Noting that the Army was confident of the performance of the ZEUS missile itself, he cautioned that this area (missile technology) was really the least of the problems inherent in missile defense.56

Seemingly impressed by Putt's views and realizing that key aspects of WIZARD had been officially cancelled following the McElroy order in January, the Armed Services Committee voiced second thoughts as to the propriety of proceeding with only the single ABM program, NIKE-ZEUS. Further, certain

55Ibid., p. 4778.

committee members worried that a deployment decision taken at this time would freeze the technology at a point where the system would not be effective enough to warrant the expenditure of the billions of dollars required to put ZEUS into operation.

The Armed Services hearings, by attempting to penetrate the surface of the interservice debate, seemed to raise more questions than they settled. While the Army had described the ZEUS system as they then envisioned it, the Air Force had cited a number of technical problems which were viewed as potentially damaging to ABM performance. While most of the actual terminology is deleted from the public version of the testimony, a careful reading indicates that questions of decoy discrimination and radar blackout were brought up numerous times.\textsuperscript{57} In addition to airing these specific problems, the testimony reopened the question of Air Force participation in ABM development.

In the following months, continued Air Force pressure led to a token reinstatement of the WIZARD design studies. DOD guided Missile Director William Holaday authorized funding of the Convair-RCA and Lockheed-Raytheon portions of WIZARD, at least through the remainder of FY1958. This response to a direct appeal from Air Force Secretary Douglas came just eleven days prior to the cutoff date (March 31) for the previously-allocated WIZARD funding.\textsuperscript{58}

\textsuperscript{57}See, for example, \textit{Investigation}, pp. 4780 (blackout) and 4804 (discrimination).

\textsuperscript{58}This expenditure was small ($3 million), and would carry WIZARD only through June 30. See "Convair Gets $3 Million to Keep WIZARD Going," Aviation Daily, April 8, 1955. After June 30, WIZARD disappeared as an ABM concept and design contract, although Air Force development of various advanced radars continued. "USAF Appeals Anti-Missile Decision," Aviation Week, Vol. 68, March 17, 1958, p. 19; and "Wizard Reactivated," \textit{Aviation Week}, Vol. 68, April 7, 1958, p. 27.
THE AIR FORCE GAINS AN ALLY, AND ZEUS PERFORMANCE IS CHALLENGED

In the weeks following the formation of ARPA, it became clear that the intra-administration debate as to the advisability of NIKE-ZEUS deployment had taken on a new form. Two factors acted to shift the context of the argument from one of service rivalry to one exhibiting quite different characteristics. First, the formation of ARPA placed the civilian defense scientists in an institutional position which greatly facilitated their participation in Defense Department weapons acquisition decisions. Men like ARPA Chief Scientist Herbert York were to play key roles in future ABM debate.

The second factor which modified the structure, if not the tone, of the debate was the particular form of anti-ZEUS argument being put forth by the Air Force. Utilizing the kind of cost-effectiveness calculus popularized by the RAND Corporation, the Air Force generated a direct attack on the utility of expending some four or five billion dollars for a system

59 ARPA was formally established on February 8, 1958, with Roy W. Johnson named as director.

60 Civilian scientific expertise had been brought closer to the center of political decision-making at the White House level in November, 1957, when President Eisenhower moved his Science Advisory Committee (PSAC) from the Office of Defense Mobilization into the White House and created the office of Special Assistant for Science and Technology. M.I.T.'s Dr. James Killian was the first occupant of the new post. For discussions of the policy implications of the formation of Killian's office, see Robert Gilpin and Christopher Wright (eds.), Scientists and National Policy Making (New York: Columbia University Press, 1965), p. 114; and Eugene Skolnikoff, Science, Technology, and American Foreign Policy (Cambridge: M.I.T. Press, 1967), p. 226.
with the performance characteristics of NIKE-ZEUS. Because this argument's line of reasoning provided one of the bases for anti-deployment positions for ten years, and because it explicitly compared alternative strategic weapons representing parts of the U.S. defense inventory, it is useful to elaborate it here.

The conceptual basis for the cost-effectiveness view is straightforward: Any policy choice for which costs and performance estimates may be generated should be compared to alternative means of attaining the same objectives. If, as the Army was arguing, NIKE-ZEUS was designed to protect the population of the U.S., then the price-tag was too high. This country was already funding a large strategic offensive force structure, whose mission it was to protect population by deterring nuclear attack. Already faced with a restrictive resource ceiling and an overwhelming demand to bolster post-SPUTNIK offensive forces, ABM advocates found it difficult to compete for the necessary funding for their system. If the mission of ZEUS was defense of these U.S. offensive forces (as per the RAND argument cited earlier), then alternative means of assuring the arrival of offensive forces on target–hardening, increased alert, dispersal, or purchase of more of such forces—could yield equivalent results at less cost.

The Air Force presented a second kind of cost-effectiveness argument, one whose roots ran deeply into the basic Army-Air Force rivalry. Delivered in technical terms, this objection to NIKE-ZEUS came to be an important rationale in subsequent anti-deployment decisions. History indicates, however, that for the late 1950's at least, the validity of this position was highly dubious. Basically, the argument stated that the offense could
always, through technological advance, defeat the defense. Such a general assertion may or may not be true. In any case, it remained for the Air Force to put the criticism in the context of the ZEUS deployment question, and it was here that the argument appears to have been misused.

Understanding that the Army was designing its ABM against simple first-generation ICBMs and IRBMs, the Air Force began a free-wheeling process of generating offensive techniques capable of penetrating NIKE-ZEUS. While such a process had obvious value regarding innovation in the area of penetration aids (penaids), the resulting interservice dialogue was more an indication of Air Force philosophy (the superiority of the offensive threat) than a reflection of technological reality. While penaids such as mid and terminal-phase trajectory modification, complex decoys, or electronic jamming equipment were by no means infeasible, they were far advanced from the then current and near-future projected state of the art.

The Army, already faced with criticism of the fact that immediate ZEUS deployment meant a technology freeze at a relatively unsophisticated level, publicly said little in response to this "offense can always win" argument. While the Air Force itself may not have realized the sensitivity of the issue, the Army was faced with a difficult problem. Feeling that they understood ICBM technology well, the Army could not foresee the utilization of sophisticated penaids for some years in the future. However, to argue this publicly, i.e., to describe the actual lack of effort in this area of research on the part of the Air Force, would be to challenge (given Soviet potential for ABM deployment) the credibility of our strategic force planning.\(^{61}\) It seems fair to say, then, that Army expressions

\(^{61}\) Interview A.
of incredulity regarding the discrimination-decoy argument stemmed both
from sensitivity as to the weaknesses in current ZEUS technology and an
uneasy feeling about attacking the capabilities of U.S. strategic offensive forces. 62

The administration view that NIKE-ZEUS was not yet ready, an argument
backed by the Air Force and the President's Science Advisory Board, 63 was
not countered effectively by the Army. Although the latter service's
FY1959 request for $136 million for pre-production expenditures was re-
ceived favorably by some members of Congress (Vinson recommended such
funding), the money was not appropriated. That budget did provide a level
of research and development funding for ZEUS which the Army found adequate.
While the President and his Defense Secretary opposed deployment of an
apparently inferior system, they did choose to support further R&D fully.
A total of $262.7 million was appropriated for this purpose, $242.7 million
for advanced ZEUS development and hardware, and $20 million for more
futuristic ABM R&D by ARPA. 64

62 Bell Laboratories officials were apparently quite angry at the Air
Force for its "sophisticated decoys" argument. To cite one writer's re-
counting, "One Bell official has been quoted by military sources as saying
that visionary things (i.e., decoys) are fine but that Bell wished to work
on things that were practical." See James Fusca, "USAF, Army Wages Battle
for Control of Missile Defense Systems," Aviation Week, Vol. 68, February
24, 1958, p. 69.

63 PSAC members were highly skeptical of NIKE-ZEUS' ability to prevent
enemy penetration through saturation tactics. Although these scientists
were dubious as to the feasibility of the components of ZEUS, they favored
a major R&D effort to advance the state of the art in ABM systems.
Interview F.

64 "Counter-ICBM Spending Due," Electronics, Vol. 31, October 3,
1958, p. 17.
The ABM issue had risen to the highest decision level—the action by Eisenhower and McElroy constituted the first Presidential-level decision on missile defense deployment. Some of the peculiarities of the post-SPUTNIK environment have been discussed above, as have the positions of the key protagonists in the 1957-58 version of the debate. Because this study seeks to relate the nature of defense decision-making to the presence of certain complex factors impinging upon policy choices, it would be useful to review the FY1959 budgetary decision on ABM in terms of the specific roles of political, strategic, and technological variables in the decision against ABM production. Why did the Eisenhower administration act as it did, and how does the analytic approach utilized here contribute to the description of those actions?

THE ARMY DILEMMA: EVEN SPUTNIK WAS NOT ENOUGH

A perfunctory analysis of the decision not to fund NIKE-ZEUS at this time could easily explain the administration's actions in the straightforward terms of Secretary McElroy: The weapon was not yet developed to a point which warranted such a production decision. Thus, a technological argument—such as the Secretary presented—provided the basis for the negative decision. There is no a priori reason to doubt the validity of this rationale, and yet previous experiences in defense decision-making suggest that our analysis can benefit by looking beyond this one argument.

There are, for example, two generalizations found in the defense policy literature which can be interpreted as predictions of a favorable decision on NIKE-ZEUS, given the circumstances of 1958. There is first the observation that significant crises or challenges from external sources
tend to trigger innovative policy shifts (and a ZEUS production decision would be such a shift) on the part of the United States. That SPUTNIK was interpreted by this country as a serious challenge is undeniable; that ABM would have been seized upon as the necessary response is quite a different matter.

A second argument, sometimes made by the military services, is that weapons should always be produced if and when they are shown to be feasible. This particular position has been documented, and severely criticized, by a group of authors who see the weapons acquisition process governed by a kind of technological determinism: If a system shows any potential of performing, it will be deployed. The application of this highly critical view of defense decision-making to the case at hand reinforces the "reaction to crises" hypothesis. Given the challenge of SPUTNIK, and accepting the fact that ZEUS (at some low level of performance capability) was at least feasible, one could predict a decision contrary to the historical fact.

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66 For an example of this position, see Colonel H. A. Crosby (USA, retired), "The Case for Anti-Ballistic Missiles," U.S. Naval Institute Proceedings, July, 1967. To quote Colonel Crosby: "The arguments for or against ABMs should be based entirely on one premise and one premise only. Will they do the job assigned to them?" (p. 31).

67 See, for example, Ralph E. Lapp, The Weapons Culture (W.W. Norton & Company: New York, 1968), p. 12. The strength of the "technological determinism" argument stems in part from the fact that many weapons systems, spawned in time of crisis, were approved for production at points in their development when their operational feasibility was highly uncertain. Peck and Scherer treat this issue directly. See especially chapters 2 and 11.
The actual course of events in 1958 does appear amenable to a more satisfactory explanation, one which indicates why the above hypothesis regarding a deployment decision did not hold true. This reinforcement of Mr. McElroy's straightforward technological rationale entails examination of strategic, political, and organizational variables present at the time. Each of these three factors served to counter an otherwise plausible expectation for deployment, the "response to crisis" idea.

In this first year of its existence as a major defense issue, ABM suffered from a serious problem of saliency. Relatively unknown to the Congress or general public in previous years, the concept of ballistic missile defense was greatly overshadowed by questions of offensive missile capability and space prowess. It was difficult to excite people about an ABM when the question of ICBMs had not yet been fully grasped. Further, American strategic policy had not yet come to accept the philosophy that a nuclear posture should place any significant emphasis upon the concept of damage limitation. The structure of the deterrent emphasized the offensive forces, and the defensive systems of the time (DEW Line, SAGE, BMEWS) tended to be viewed more as protectors of the offensive response than as defenders of the population.

The deterrence philosophy, assuming as it did that extensive population defense was impossible or impractical, actually generated arguments to the effect that overemphasis on defense, far from aiding the nation, in fact weakened it by demonstrating doubt in the adequacy of the deterrent as the ultimate defense. The initiation by the Army of an argument which

68 This line of thinking carried over into the offensive force planning area, where early advocates of a counterforce utilization of U.S. offensive weapons were accused of doubting and/or weakening the deterrent.
clearly contended that we could defend against ballistic missile attack was therefore met by doubting if not incredulous responses on the part of many informed individuals.\textsuperscript{69} It seems fair to argue that ZEUS, even if it had shown significantly greater technical promise, would nonetheless have encountered heated opposition from those whose operational philosophy was built upon the deterrence concept. The Air Force, having presented its budget to Congress for many years in the context of that concept, was able to generate considerable legislative support in its attack against the Army plan.

Even accepting the newness of the ABM idea, the predominance of offensive thinking (due both to the strategy and to the nature of the SPUTNIK challenge), and the low status of ABM technology, it is possible to conceive of an administration funding ZEUS. A President bent upon preserving options and willing to operate a relatively open-ended defense budget might have made just such a choice. However, the Eisenhower approach to this part of the budget process represented the crowning blow to the Army plan. Operating under a "ceiling" technique which guided its policy choices, the administration simply had no resources left for the kind of program which Secretary Brucker and his aides proposed. Indeed, the amount funded for NIKE-ZEUS in FY1959 ($262.7 million) represented a significant resource allocation, even though it limited the Army's efforts to research and development.

\textsuperscript{69}For an example of the kinds of perceptions of defense held by strategists in these years, see Bernard Brodie, \textit{Strategy in the Missile Age}, Chapter 6, "Is There a Defense?"
In this year of the first ABM deployment proposal, the Army found itself faced with a cumulative set of forces operating against approval of NIKE-ZEUS production. Lack of understanding about what ballistic missile defense was all about, presence of a nuclear strategy which distrusted defensive systems, and an administration leery of another interservice weapons race, combined with the low technological status of ZEUS, doomed the Army plan. McElroy's argument that the system was not ready for production thus went far beyond a simple reference to technology: The Congress, the nuclear strategy, and the rivalry-plagued Defense Department were indeed not ready for such a decision.
CHAPTER III
TECHNICAL DIFFICULTIES AND POLITICAL DEBATE

The remaining years of the Eisenhower administration saw the Army present NIKE-ZEUS deployment plans to the President in three more budget cycles. Although ABM technology underwent numerous improvements between early 1958 and late 1960, the administration continued to reject the Army proposals. While the Army argument changed little during this time, the nature and strength of the opposition, those who did not believe that deployment should be undertaken, was modified significantly. In order to describe properly the essence of the FY60 through FY62 editions of the ABM debate, it is necessary to document the context of these new confrontations between the Army and its detractors.

A NEW ORDER OF BATTLE: THE DEFENSE SCIENTISTS ENTER THE FRAY

Even as the FY59 budget was being scrutinized by the Congress, Secretary McElroy was beginning to reap the benefits of the organizational changes within the DOD technical community which had been initiated the previous fall. ARPA, the new research agency which had taken over much of the advanced ABM work, gradually arrived at a full complement of civilian scientists. More important, the special technical committee created in late 1957 by Director of Guided Missiles, William Holaday, provided the Secretary with a detailed final report on the entire reentry discrimination question which plagued NIKE-ZEUS.

The Reentry Body Identification Group's analysis, presented on April 2, 1958, outlined major areas where further ABM research was seen as necessary. In the words of one defense engineer:
This was the most comprehensive and formal work that had yet been done to focus on the realistic problems facing the defense. The influence of the committee's work, direct and indirect, was profound, and it is no exaggeration to state that almost all of the primary problems which would engage the technical community working on ballistic missile defense from then to the present time were set forth in this report.¹

With these and other recommendations as guides, the DOD scientists continued to study both ABM capabilities in general and NIKE-ZEUS in particular. ARPA utilized two groups, its own Ballistic Missile Defense Group, headed by Dr. Richard Holbrook, and the Advanced Research Projects Division of the Institute for Defense Analyses, supervised by ARPA Chief Scientist Herbert York, in pursuit of information of ABM.² The general tone of the ARPA conclusions tended to be that ZEUS was inadequate, and that ABM technology had to move beyond the level of sophistication which the current Army plan represented.

In anticipation of renewed Army efforts to secure an administration commitment to ZEUS deployment, Secretary McElroy in the fall of 1958 created yet another group of scientists to advise him on the issues involved. The members of this committee, known as the Skifter panel, were Hector Skifter (from the office of the Assistant Secretary of Defense for R&D).

¹Payne Speech, p. 5. One of the innovative concepts discussed by the Reentry Body Identification Group was phased array radar, a technological watershed in subsequent ABM development.

ARPA's Herbert York, and Guided Missile Director William Holaday. These three technical experts began immediately to study the status of the U.S. ABM program. In October, the Secretary of the Army formally presented McElroy with a large ZEUS deployment plan, with production funding to be initiated in FY1960. Actual deployment was projected to begin in late 1962 or early 1963, and total program costs were set at $10 to $20 billion, well above earlier Army estimates.

Internal administration deliberations on the FY60 budget saw the APRA opposition to deployment reinforced by two sources. The Skifter committee, while appearing somewhat ambivalent on the issue, suggested a program approximately half the size of the Army plan. The Joint Chiefs of Staff, with only Army Chief of Staff Maxwell Taylor dissenting, recommended (as they had in November, 1957) that production not be started. Secretary McElroy, influenced both by these recommendations and by the budgetary ramifications of the full Army proposal, decided to maintain ZEUS in an R&D-only status, with the option left open as to possible funding of some long lead time pre-production items.

In his January, 1959 budget presentation, the President asked only for R&D funds and some military construction allocations needed for the planned ZEUS testing facility at White Sands Missile Range. The Army, endeavoring to gain a funding authorization more in line with Secretary Brucker's

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3 Interview B.

4 Payne Speech, p. 6.

5 Ibid. The Army request for FY60 was for $1.003 billion.
October 1957 recommendation, once again made its feelings known to the Congress. The central point of contention, as the Army saw it, was the validity of the various technical assessments of NIKE-ZEUS being used in argument by both sides. In basing their position on these terms, the Army was soon to discover that they had challenged their opponents, the civilian scientists and engineers in DOD, in an area where the military was at a distinct disadvantage. Unlike the interservice debate of early 1958, the 1959 dispute found the Army unable to benefit from the kinds of strategic and military arguments with which the services felt most at ease. From the Army viewpoint, the results of this situation were quite discouraging.

The Congress was again to provide a forum for the protagonists to argue for or against ABM in general and ZEUS deployment in particular. While the Armed Services Committees were holding their annual authorizations hearings, another committee took a special interest in the ABM question. The fledgling House Science and Aeronautics Committee, led by its chairman, Overton Brooks, and a second key member, House Majority Leader John McCormack, demanded that the Army and DOD air their views on the subject of ABM. The Army, toning down their earlier arguments regarding possible strategic disaster for an America devoid of ABM, shifted the nature of their presentation.

Accepting the basis for the DOD argument that NIKE-ZEUS was not then at an advanced stage of technological development, Army Major General William C. Dick portrayed such an observation as being somewhat irrellevent. 6

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6 "Nike-Zeus Delay is Criticized," Baltimore Sun, February 10, 1959. The Science and Aeronautics Committee is hereafter referred to by its popular name, the "Space Committee."
Had not the Air Force's ATLAS and Navy's POLARIS, two strategic offensive weapons systems, been funded at points in their development representing the same kinds of uncertainties which faced NIKE-ZEUS? While McElroy had the week before told the House Armed Services Committee that a production decision on the program was probably two years away, both Dick and Major General D. E. Beach (Army Air Defense and Special Weapons Director) said that the technical arguments behind the Secretary's view had not come from the Army.\footnote{Ibid.}

Arguing that the ZEUS development program was on schedule and progressing in a "most encouraging" manner, the two generals indicated that other advisors had apparently swung the Secretary of Defense away from the deployment plan.\footnote{"2 Say McElroy Barred ICBM Killer Project," New York Herald Tribune, February 10, 1959. The implicit yet obvious reference by the Army was to the civilian defense scientists.} The Army also repeated a criticism often heard amidst the flood of accusations which followed the SPUTNIK shock, the view that problems in weapons systems development at the service level were often the result of over-administration and red tape at the top of the DOD structure.\footnote{DOD seemed quite sensitive to this kind of criticism. See, for example, testimony by Assistant Secretary of Defense W. J. McNeil to the Joint Economic Committee, quoted in "Slowdown in Nike-Zeus Study Denied," Baltimore Sun, February 11, 1959.} The Space Committee had heard the Army case, and it now waited to hear Secretary McElroy himself present his department's views. The two days preceding the Secretary's appearance saw a remarkable flurry of effort on both sides designed to make the Army and administration positions as salient as possible.
In a special interview with the Washington Star, General Beach said that "no new technological breakthroughs" were needed to make ZEUS an effective ABM weapon. He viewed the budgetary difference between the Army and DOD requests for ZEUS (some $730 million) as necessary for his service to proceed with the task of building an operational ABM.\textsuperscript{10} The administration, meanwhile, marshalled some support of its own, including a pair of influential congressmen. On the Democratic side, House Defense Appropriations Subcommittee Chairman George H. Mahon told a reporter: "I agree with the President that we should not provide funds at this time to go into production of the anti-missile missile. I feel very strongly about this."\textsuperscript{11} Mahon too couched his argument in technical terms. Although he said he welcomed the Army's enthusiasm regarding ZEUS, he challenged their claim that no further scientific breakthroughs were needed prior to a production decision. Mahon's position was reinforced by another technically knowledgeable congressman, this time a Republican. Representative Fulton of Pennsylvania, a senior member of Brooks' Space Committee, explained that a combination of speed and range factors made ZEUS unacceptable.\textsuperscript{12}

In anticipation of congressional fears that the administration was moving too slowly on the ABM question, DOD released detailed information regarding ARPA research designed to look beyond current (i.e., NIKE-ZEUS)


\textsuperscript{11}Ibid.

\textsuperscript{12}Ibid.
ABM technology. It was announced that under its Guide Line Identification Program for Anti-Missile Research (GLIPAR), ARPA would let five or more design study contracts in March, each investigating post-1959 ABM possibilities.\(^\text{13}\) These studies would not be required to demonstrate the feasibility of such ABM techniques as anti-gravity, anti-matter, radiation, and laser systems, but would instead indicate degree of promise or non-feasibility, thus facilitating later and more intensive focus upon the most promising alternatives.

The context of the issue had been set: Was or was not the current NIKE-ZEUS system technically capable of performing the ABM mission satisfactorily versus the kind of Soviet missile force postulated to exist at the time of completion of ZEUS deployment? Mr. McElroy, armed with various scientific arguments, presented the administration view to the Space Committee. The Secretary explained that, although one group of scientists had recommended production earlier, "the best scientific opinion" was that the Army system was not far enough developed and had too many technical problems.\(^\text{14}\) This view, he stressed, was a technical assessment, not a position determined by any budgetary considerations.

McElroy went on to describe the review of ABM performed by his three man panel the previous fall. Two of the three (the Secretary refused to name them, but they were Skifter and Holaday) recommended deployment, while the third, Dr. York, dissented. Mr. McElroy then explained that,


because of the lack of consensus on the Skifter panel, he referred the
issue to the President's Science Advisory Committee. PSAC, an organiza-
tion which in those years enjoyed significant influence in the making of
national security policy, also recommended against production of ZEUS,
again on technical grounds. The Secretary concluded his presentation
with a description of the operational characteristics of the Army's ABM,
stressing that the overriding difficulties were in the radar and compu-
tation systems, not in the NIKE-ZEUS missile itself.

The remaining days of March found McElroy's position reinforced from
a number of other sources. ARPA Director Roy Johnson, also appearing be-
fore the Space Committee, presented his technical assessment in these
terms:

Without exception, we believe that (ARPA) studies
have left as unknowns major questions concerning the
signals from ballistic missiles flying above the at-
mosphere....Also there are unresolved questions con-
cerning the feasibility of kill mechanisms.

A second technical-strategic analysis, this time performed by the Weapons
Systems Evaluation Group (WSEG), a research affiliate of IDA which conduc-
ted systems analyses for the Joint Chiefs of Staff, indicated that even
if NIKE-ZEUS performed as advertised, it would be ineffective. The reason:

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15Ibid. Also Interview B, Interview H.

16This particular fact had been difficult to convey to the Congress,
and the problem was to be exacerbated by Army information releases in later
months which emphasized the fact that ZEUS was an accurate and dependable
missile. Such statements, while accurate in proper context, confused the
issue of overall system performance.

17As quoted by Mark Watson in "Scientists Put Anti-Missile Success
the enemy could still inflict considerable casualties by detonating their warheads just beyond the range perimeters of the ZEUS batteries. The WSEG study did suggest a way by which this tactic could be partially countered: A large expenditure for **fallout shelters** could reduce fatalities caused by the upwind targeting.

Finally, the newly created office of Directorate of Defense Research and Engineering (DDR&E), which replaced the old Assistant Secretary of Defense for Research and Development, submitted an ABM assessment of its own. The first director of DDR&E, former ARPA Chief Scientist Dr. Herbert York, sent to McElroy a memorandum opposing a production commitment on technical grounds. As the budget moved into the appropriations phase, DOD had good reason to believe that it had made its case well. However, the final stages of the FY60 budget deliberations were to be affected significantly by some ongoing and complex technical and strategic developments, factors which seriously complicated the entire question of ABM performance. Given the importance of these developments, it is useful to examine them in detail.

**THE OFFENSE-DEFENSE DUEL: PENETRATION AIDS FLOOD THE DEBATE**

A central observation regarding the nature of technical evaluations of ABM is that such assessments are highly dependent upon the characteristics of the strategic threat postulated against the missile defense

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18 Interview B. This argument, known as the "upwind tactic," became quite prominent in subsequent debate regarding NIKE-ZEUS and later variations of point defense deployments.

19 Payne Speech, p. 7.
system. An ABM capable of acceptable performance versus one kind of offensive force can be quite inadequate when faced with a larger or more sophisticated ICBM threat. An underlying cause of the profound Army-DOD disagreement as to NIKE-ZEUS capabilities in the Eisenhower years stems directly from differential assessments of this kind. Unfortunately, from the standpoint of open communications in this debate, organizational philosophies and value judgments regarding strategy acted to keep the heart of the issue buried beneath the rhetoric of the argument.

The problem seems to have originated in the Army's approach to the ABM question, an approach understandably dictated by the technology and strategic environment of the day. The single most outstanding observation to be made when studying the ABM task in the 1950's was that one had somehow to hit a single object moving through space at 10,000-15,000 miles per hour. Thus, the Army formulated the initial problem as being "how to hit a bullet with a bullet." The concept was one characterized by a "duel," two super-fast rockets facing each other, ABM versus ICBM. The outcome was expressed in zero-sum terms: One side was total victor, the other, complete loser. The combination of missile, radar, warhead, and computer technology utilized in the NIKE-ZEUS system did seem able by 1957-58 to "kill" an incoming object, and nuclear weapons effects removed the necessity for the ABM rocket to hit the incoming warhead physically. A near miss was sufficient for the ABM to impart fatal damage to the reentry vehicle (RV).
Given the fact that the Army had defined the ABM problem as a sort of duel, that service took this technical accomplishment—ability to intercept an incoming object—as an indication of solution of the entire missile defense issue. The result was the prediction, made publicly by Army generals, that a 100 percent effective ZEUS system could be built. Critics of the Army view were quick to challenge the basis for that service's optimism. The kinds of issues which were raised demonstrated that the "duel" idea was an inadequate characterization of the environment in which ABM had to operate. While certain of these criticisms were based upon citations of offensive countermeasures as yet unproven themselves, the general debate was beneficial in that personnel involved began to scrutinize more carefully the kinds of problems facing an operational ABM system.

As the congressional testimony of 1958 indicated, even the effectiveness of ZEUS in the duel situation was open to question, in that the short time between ABM radar identification of an incoming warhead and the arrival of that weapon over the target placed extreme speed requirements on the ZEUS missile and its guidance computation gear. Given this difficulty, it was also conceivable that an enemy, knowing that interception would necessarily take place at a low altitude (under twenty miles), would time his warheads to detonate at a point just above the intercept range, thus inflicting casualties on the ground and possibly disrupting or knocking out

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20 See, for example, General Gavin's comments in John W. Finney, "Army Says Missile Defense Can Become 100% Effective," New York Times, June 13, 1957. This view seems to have been influenced significantly by the Johns Hopkins study of ABM in 1957, a study which did not question seriously the strategic implications of the "Duel" assumptions.
the radars of the ZEUS system.21

Continuing improvements in radar range and computation speed through
1960 moved the maximum intercept height up to a point at which the offense's
high altitude detonation tactic became ineffective as a means of population
attack, although the radar blackout problem persisted. However, a pair
of additional problems of some magnitude arose, and debate came to center
upon these new considerations. An important realization found in post-
SPUTNIK reassessments of the strategic weapons situation was that a Soviet
ICBM threat would consist of many weapons, and that the one-on-one "duel"
idea must be shifted to a "many-on-many" kind of attack.

While such a situation had little or no impact on assessments of
ZEUS missile performance (a single ZEUS could still challenge a single
object), the implications for ZEUS's complex four-radar acquisition/track-
ing/guidance system were grave. In the words of one defense engineer:

As there could be many objects coming in, either
purposely or inadvertently (each warhead would be
accompanied by booster fragments, and could optionally
disperse simple decoys), the system almost required a
radar for each object aimed at a city. Thus a typical
battery might contain as many as 30 radars and yet still
be saturated!22

The saturation issue, combined with the point-defense nature of ZEUS, facili-
tated the argument that the system could not provide anything approaching

21 The vulnerable status of the ZEUS' mechanically slewed radars meant
that small levels of overpressure caused by such detonations could knock
out these "soft" units.

22 See Daniel J. Fink, "Strategic Warfare," Science and Technology, Octo-
ber, 1968, p. 58. Dr. Fink, former Deputy DDR&E Director, has been an in-
formative analyst of the kinds of strategic and technical perceptions and
assumptions characterizing various stages of the ABM debate. See too Fink's
"Changing Views of BMD," Speech delivered to NIKE-X Program Managers Meeting,
Winston-Salem, North Carolina, November 28, 1966. Hereafter called "Fink
Speech."
an effective defense. For some reason, however, this particular view did not constitute a central point of contention in the Army-DOD confrontations before the Congress. The much more salient (and obviously closely related) criticism used by ZEUS' detractors involved the decoy discrimination issue, an argument which sought to demonstrate the inadequacies of the Army system regardless of the number of missiles attacking a given target.

As the Air Force carried on the development work attendant to America's own ICBM program in the late 1950's, that service came to realize that a warhead was or could be assisted in the penetration task by a number of techniques. First, each offensive missile had a built-in decoy in the form of the final stage of the booster rocket. Further penetration aid could be gained by using a small explosive charge to fragment the booster into multiple decoys, each constituting a radar image with which the ABM radar was forced to deal. Because the portion of an ICBM flight path occurring immediately after apogee (maximum altitude) lies in an essentially complete vacuum, all objects—regardless of mass—move at the same velocity.

The offense could therefore utilize not only booster fragments, but also very light decoys such as balloons. Because the slow response and acceleration capability of ZEUS forced the ABM system to launch the interceptor missile while the incoming warhead was still well beyond the atmosphere, such light decoys were quite adequate in fooling the acquisition radars.23 Thus, even a single offensive missile could, through judicious utilization of its booster and light decoys, "saturate" a ZEUS unit whose

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radars were basically capable of tracking only one or a few objects at any one time.

While this particular form of the decoy discrimination argument represented an effective criticism of the 1957-59 NIKE-ZEUS, it was understood that ABM system improvements could probably overcome the problems of unsophisticated decoys. If the defense could obtain somewhere in the neighborhood of 100-300 more seconds between initial target acquisition and ABM launch, it could benefit greatly by the "sorting" phenomenon which occurs as lighter decoys encounter friction resistance from the upper stages of the atmosphere. The scientists concerned with offensive penetration, realizing this, created (on the drawing boards, usually), more complex and exotic penetration aids:

Decoys, jammers, chaff, blackout, etc. were all invented in the late '50's, on paper at least. There were light decoys, heavy decoys, jacks, darts, balloons, light chaff, heavy chaff, precursor chaff, noise jammers, repeater jammers, main lobe jammers, side lobe jammers, narrow cones, absorbing cones, tank fragments, precursor blasts, you name it. As fast as the defense invented a solution to an assumed offense, the offense would invent a new threat. The defense was on the defense!24

While the more sophisticated of these pen aids were well beyond current technology, even the simple techniques such as balloons, tank fragments, and precursor blasts presented serious problems for NIKE-ZEUS.

The duel concept, while continuing to dominate the perceptions and analyses relevant to ABM, had become much more sophisticated. It was now a contest between a single defensive battery and an entire cloud of incoming

24Fink Speech, p. 3.
objects. Unfortunately for ZEUS, ABM did not fare nearly so well in this kind of problem as it had in the earlier one-on-one version of the engagement. In the absence of any semi-realistic testing environment (there did not yet exist even a prototype ABM battery against which to pit various penaiid techniques), the debate as to the technical capabilities of both defense and offense raged on.

THE HIGH-ALTITUDE TESTS: MORE UNCERTAINTIES FOR ABM

As the ABM debate began to grow in 1958, the United States conducted its first high-altitude nuclear weapons tests. Two megaton-range shots, codenamed TEAK and ORANGE, were detonated at 252,000 feet (approximately 50 miles) and 141,000 feet (approximately 27 miles) altitudes respectively near Johnston Island in the Pacific. 25 Conducted as part of the HARD-TACK series, these tests took place on August 1 and 12, 1958, and "caused widespread disturbances in that portion of the upper atmosphere known as the ionosphere, and this affected the propagation of radio waves and other similar electromagnetic radiations of relatively long wave lengths." 26

A few weeks later, another series of tests, the ARGUS shots, were conducted in the South Atlantic. These small-yield detonations were designed to provide information on the trapping of electrically charged particles in the earth's magnetic field. 27 Certain effects upon radio


26 Ibid., p. 51.

27 Ibid., pp. 50, 677. The ARGUS dates were August 27 and 30 and September 6. The yields were listed as 1-2 Kilotons.
and radar frequencies were observed here also. Evaluation of data gathered from these five tests increased speculation on two technical issues central to ABM performance. First, how did such explosions affect the performance of various radar systems, and second, did high altitude nuclear weapons effects provide additional insight into the question of ABM mechanisms for destroying incoming warheads?

As the results of these tests filtered through the defense scientific community, there arose the feeling that such information should be made public. Once it was agreed that the Soviets knew the theoretical effects of such tests, the Defense Department released certain general results. The date of release was March 19, 1959, squarely in the midst of the Army-DOD exchanges in the House Space Committee. While the level of information on the high altitude tests possessed by these protagonists in the ongoing debate was probably somewhat more detailed than the public record indicates, a brief review of that record may be useful. Such an examination aids in clarifying the impact of the test results upon the positions and arguments of ABM's supporters and opponents.

As a part of the TEAK and ORANGE shots, the Army tested its high-frequency communications band designed for use in the ground control intercept (GCI) system for NIKE-ZEUS. According to one authority, "the nuclear detonations did not interfere with this communications frequency."28

The Army apparently concluded from this that ZEUS would not be impaired

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by nucleonic interference generated by such explosions. There was, however, considerable speculation and evidence as to the possible "blackout" effects of high-altitude nuclear shots. While certain scientists claimed that a precursor blast tactic—the use of a few high-altitude explosions to black out enemy ABM radars prior to arrival of the remainder of one's ICBM force—was both feasible and effective, Army technical personnel said that there were no indications from the tests which cast doubt on NIKE-ZEUS' effectiveness.\(^{29}\)

A second nuclear effect, this time potentially beneficial to ABM development, was also observed in the tests. Detonations in the region above the discernable atmosphere released a large portion of their energy in the form of neutrons, which radiated out for many miles in an instantaneous burst, or flux. These subatomic particles, representing extremely high energy levels, were capable of altering or destroying the structural integrity of certain materials. Thus, while more conventional kill mechanisms such as blast and heat are not propagated in the vacuum of space, neutron flux was seen as a possible technique for destroying incoming reentry vehicles (RVs) high above the surface of the earth.\(^{30}\)

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\(^{29}\)Ibid. For a detailed discussion of alternative ABM detection methods and corresponding jamming difficulties, see "The New Look of Missile Defense," *Business Week*, March 7, 1959, pp. 36-38.

\(^{30}\)Such a kill mechanism or any other destruction method does not have to destroy the offensive warhead at the time of ABM detonation. Alternatively, it is possible to damage the RV's shielding to such an extent that the rigors of subsequent atmospheric reentry would itself destroy the warhead. A second exoatmospheric nuclear weapons effect, thermal X-ray emission, was also observed, but the design of the TEAK and ORANGE devices was such that the X-ray phenomenon did not appear that important as a kill mechanism.
Finally, the high levels of ionization created by the tests were not significantly attenuated for some hours after the time of detonation. Such a phenomenon led to speculation that a sort of "umbrella shield" against ICBMs could be generated by a series of such detonations. This and other questions were asked of Deputy Defense Secretary Donald Quarles in a press conference on the tests. Quarles was somewhat evasive as to specific data, but he did note that nothing in the results of the ARGUS experiment had caused any alteration in the basic concept of the NIKE-ZEUS effort. The "umbrella shield" idea was discounted through a description of the energy levels—levels too low to be lethal to an RV—attendant to the ionized cloud which lingered after the explosions.

While the statements by Army officials and by Secretary Quarles provided no cause to doubt ABM capabilities in light of the high-altitude detonations, the debate in later years indicates that the kinds of weapons effects observed in the 1958 tests were of significant importance in this area. What appears at first glance to be a major discrepancy between the Army-Quarles observations and subsequent Atomic Energy Commission information seems explainable in straightforward terms. Indeed, a brief examination of these issues here provides additional insight into the COD and Army positions on ABM in mid-1959.

Of the three questions mentioned above which grew out of the 1958 tests, two were deemed to have been answered by a consensus of technically competent observers. The neutron flux kill mechanism, while representing a potentially lethal technique against certain kinds of mechanical structures (an unprotected satellite, for example), appeared ineffective.

against ICBM RV's which carried shielding sufficient to protect them from the rigors of atmospheric reentry. In answer to growing press speculation that these neutrons could neutralize or even prematurely detonate the incoming warhead, noted M.I.T. physicist Victor F. Weisskopf publicly explained that, except for cases involving very small miss distances, neutron kill was not really an effective means of performing the ABM mission.\footnote{The "umbrella" idea nonetheless died hard. The Philadelphia Inquirer provides an example of the lingering hopes for a perfect ABM in a March 20, 1959, editorial: "It would be wonderful, indeed, if this magic-like film of radiation could be counted upon as a foolproof shield against atomic attack. It may well be that the shield is really impenetrable."}

The second issue, that of the umbrella shield, while generating a degree of wishful thinking on the part of some, seemed settled as a result of the short duration and rather low energy levels of the ARGUS and HARDTACK "umbrellas." Such an effect, while having serious electronics implications, did not provide a missile-killing shield.

The third issue raised by the nuclear tests, that of the possible disruptive effects of high-altitude ionization on radio and radar, was not so easily dealt with. The data were open to some manipulation, and pro-ABM and anti-ABM arguments selectively interpreted the test results in ways that bolstered their individual positions. What in fact occurred was that different people cited specific information—as to a single test or effect—and then broadened the results into more general conclusions regarding the impact of the tests on ABM capabilities.

There was no argument as to the fact that the tests, especially the larger TEAK and ORANGE shots, caused widespread disturbances in that portion of the upper atmosphere known as the ionosphere.\footnote{AEC Handbook, p. 51. VLF is "very low frequency" (3-30 kilocycles), VHF is "very high frequency" (30-300 megacycles).} Further, radio
frequencies in the VLF through VHF ranges suffered varying degrees of signal attenuation, distortion, or total blackout due to the high-altitude ionization caused by both HARDTACK and ARGUS. Radar, which usually utilizes frequencies in the VHF range, suffered only minor signal distortion so long as both radar and target were below the ionosphere, i.e., the altitude at which maximum ionization occurred.

This is the key point regarding radar interference: So long as the radar beam did not have to pass through the ionized region, and so long as electron densities were not extremely high, the VHF signal stood a good chance of suffering only minor increases in background noise.\(^{34}\)

Thus, when the Army argued that the tests did not bother the VHF band used to guide ZEUS to its target, they were clearly within the bounds of the test data.\(^{35}\) However, the ZEUS tracking radar performed most, if not all, of its functions in the atmospheric region below the ionosphere. A more relevant question regarding the tests and ABM concerns the effects of such detonations on the longer-range ZEUS radars—the acquisition and discrimination systems—whose search mission does require that they penetrate the ionosphere. Here the AEC data provides grounds for some pessimism:

In search radars, for example, where it is desired to detect each target at the greatest possible range, i.e., just as soon as the target return becomes observable against the background noise, even the smallest additional signal loss results directly in shortening of the range at which a given target can be detected. A tracking or guidance radar in a weapons system (this

\(^{34}\) Ibid., pp. 522-527. The ionosphere begins at an altitude of approximately 130,000 feet (25 miles).

\(^{35}\) The Army argument is detailed by military correspondent and strong ABM advocate Mark S. Watson. See his "Anti-Missile Funds Urged," Baltimore Sun, March 29, 1959.
is what the Army had referred to in its statements), on
the other hand, usually takes over its target, well in-
side its maximum detection range, from another (search)
radar which has already detected and tracked the object.
In this case the signal may be attenuated to a much greater
degree before the radar loses its ability to acquire or track. 36

As the 1959 budgetary debate neared its end, then, the insertion of
the exotic subject of nuclear weapons effects into the discussion had
mixed impact. Within the scientific community, the tests indicated a whole
new range of problems and promises regarding ABM systems. In the public
debate, however, the significance of HARDTACK and ARGUS had not yet fully
been grasped. The Army, anxious to increase the NIKE-ZEUS funding for
FY60, emphasized that the small-yield ARGUS tests had not given them reason
to worry and that their radar tests during the HARDTACK series had not
resulted in serious problems. The Defense Department, its technical ex-
erts doubting the ultimate feasibility of the Army proposals, stressed
the fact that the tests did have potentially serious implications for the
performance of an overall ABM system (as opposed to a single short-range
radar component of ZEUS). 37

Once again, the complexities of modern technology acted to create new
uncertainties within an issue already confronted with major questions re-
garding politics, strategy, and technology. The existence or even the

36 AEC Handbook, p. 527 (parentheses mine).

37 See the remarks of Secretary McElroy, quoted by Katherine Johnson,
"McElroy Predicts Limited Use of Nike," Aviation Week, Vol. 70, May 11,
feasibility of sophisticated penetration aids, in the form of either
decoys or judicious utilization of high-altitude precursor blasts, cast
serious doubts on the performance capabilities of NIKE-ZEUS. These prob-
lems, whether real or assumed, once again provided the administration with
a justification for a negative decision on ABM deployment.

THE FY60 BUDGET: DOD MAKES ITS CHOICE IN THE MIDST OF NEW PROBLEMS

In the weeks between the public release of the ARGUS data and the
final Senate action on the FY60 budget, the Defense Department was con-
fronted with still more controversy. Problems arose regarding three issues,
each closely related to interservice and civilian-military relations with-
in DOD. The Air Force, anxious to increase its program levels in military
space projects, charged that the existence of the civilian ARPA threatened
to delay the introduction of new space weapons into the operational inven-
tory. The new Air Research and Development Command director, General
Bernard Schriever, argued that the service to which a military mission was
assigned (i.e., Air Force and the space weapons mission) should assume
overall management responsibility for the individual programs involved.38

The recent technical criticisms of the Army's ZEUS paved the way for
a further Air Force challenge to current DOD policies and programs.
Accepting the argument against ZEUS which DOD used--that the system was
both technically questionable and overly expensive--the Air Force cited

38 Ford Eastman, "General Schriever Asks ARPA Abolishment," Aviation
Week, Vol. 70, May 4, 1959, pp. 28-29. Further indications of anti-ARPA
arguments are documented in "Demise of ARPA Urged by Furnas," Aviation
Week, Vol. 70, June 1, 1959, p. 37. (Dr. Clifford C. Furnas is a former
Asst. Secretary of Defense for R&D).
the need for fundamentally new approaches to the ABM problems, "probably
involving systems designed to operate in space." 39 Given the Army sys-
tem's vulnerability to decoys, it was suggested that an ABM be designed
which could attack ICBMs prior to the dispensing of such penards, i.e.,
in the early stages of the ballistic trajectory. Such an argument obvi-
ously entailed a policy ramification understood by all those involved:
A space-based system would tend to shift the ABM mission from the Army
to the Air Force, or so the latter service hoped.

This Air Force questioning of both the continuing need for ARPA and
the feasibility of ZEUS-type terminal ABM systems was but a prelude, how-
ever, to a much more volatile issue confronting the Defense Department.
While Mr. McElroy had in January, 1958, at least partially tempered the
Army-Air Force argument as to which service would receive the ABM mission,
he and his staff had never really succeeded in solving the quite similar
rivalry over anti-aircraft defense. In May, 1959, the Congress, in an
economy-minded move, forced the Secretary's hand on the five-year old
BOMARC-NIKE-HERCULES argument.

The Senate Armed Services Committee, generally disturbed by what its
members perceived to be inadequate weapons acquisition policies on the
part of DOD, voted major changes in the administration's military construc-
tion authorization bill. Totally eliminated were the FY60 authorize-

39 The quote is from Air Force Chief Scientist Dr. Joseph V. Charyk.
"New Approach to Missile Defense Urged by USAF Chief Scientist," Aviation
Week, Vol. 70, May 18, 1959, p. 31.
for additional NIKE-HERCULES sites. So that future DOD weapons procurement policies would be made clearer to the Congress, the committee also asked the President for a "master plan" for defense spending.

While the administration readied such a plan for presentation, interservice lobbying, reinforced by Congressional and industrial supporters on all sides, went on at a pace which rivaled the ZEUS-WIZARD debates of 1957-58. The Army, citing the fact that HERCULES was a proven operational system, asked what the country was supposed to do to protect itself between the present time and the uncertain future date at which BOMARC was to become operational. Observing that modern bombers posed a quite different threat than did the 1950-era aircraft against which HERCULES was designed to operate, the Air Force countered that BOMARC represented a necessary advancement in the state of the art, one capable of meeting the revised threat.

Sensitive to charges that it was placing budgetary restraints above defense needs and that the military was not being properly heard in the defense policy process, the administration sought to handle the HERCULES-BOMARC issue in a manner which minimized additional criticism. The plan which Secretary McElroy released on June 13 attempted more to quiet the issue than to settle it. DOD would continue to fund both of the aircraft defense systems, but at slightly lower levels. As a means of shifting attention from the basic Army-Air Force debate, the plan called for an increased effort, a sort of renewed emphasis, toward perfecting NIKE-ZEUS.41 This greater attention to ABM development was to be initiated through the

40 Jack Raymond, "Pentagon Urged to Cut a Missile," New York Times, May 14, 1959. The HERCULES had long been an operational missile, and BOMARC deployment was planned for 1961-62.

addition of some $137 million above and beyond the original DOD budget.\footnote{Ibid. This money was included in a slightly larger total addition ($157 million), and this sum was to go for "Army modernization."}

The House version of the budget had already added a $200 million amount for this same purpose, preempting the administration's actions.

While the master plan bolstered the Army position in that the administration stressed ABM systems over anti-aircraft systems, the status of the interservice rivalry and the ZEUS deployment question was not significantly altered. The Air Force, backed by numerous Congressional supporters, continued to push both BOMARC and space-based ABMs.\footnote{For examples of the pro-Air Force reaction to the "master plan," see Jack Raymond, "McElroy's Plans for Air Defense Widely Assailed," \textit{New York Times}, June 14, 1959; and Warren Rogers, "Arms Plan Runs Into Opposition," \textit{New York Herald Tribune}, June 14, 1959.} The Army, sensing an important victory in the form of the $137 million pre-production appropriation, was anxious to secure a firm commitment for actual deployment of NIKE-ZEUS. In attempting to quell one debate (the BOMARC-HERCULES affair), the administration succeeded in encouraging the Army and Air Force to renew the fight over ABM deployment. The summer months of 1959 found DOD and the two services readying their positions for the next round, the FY1961 budget formulation which was to take place in the coming winter.

\textbf{THE FY61 ARMY PLAN AND DOD RESPONSE: A FAMILIAR REFRAIN}

In October, 1959, the Army presented to Secretary McElroy a ZEUS deployment plan almost identical to that proposed a year earlier. A $10 billion deployment was foreseen, with approximately $1 billion required in
FY61 for production tooling and contracting for long leadtime items. The Defense Department, seeking again to defer a decision as wide-reaching as the Army had suggested, announced that there were no present plans to spend even the $137 million voted for pre-production expenditures for FY60. The rationale again had a technical basis: There were still too many doubts in the minds of DOD officials as to the system's performance capabilities, especially in light of the high costs involved.  

Because the Army's flight testing of the NIKE-ZEUS missile was scheduled to begin in a few months, DOD asked that service to perform a "technical reevaluation" between October and February, to include "many test firings" of the interceptor. By March, it was hoped that a decision could be taken as to whether or not to go into full-scale deployment. If a go-ahead was then given, funding would come in the form of a supplemental request to the Congress in April. In the interim, the pre-production funding could wait. Once again, McElroy's "wait and see" position was seconded by both the Joint Chiefs (with the Army dissenting) and the technical assessment of his DDR&E staff, and these groups retained their previous reasons for opposition to ZEUS: Unacceptably high costs and a fatal vulnerability to decoys.

Two DOD actions in the last days of 1959 had an impact upon the upcoming budget presentation and resulted in a noticeable increase in discussion of the technical and strategic ramifications of NIKE-ZEUS. In November, Secretary McElroy announced that, as an augmentation to the

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45Ibid.
Army reevaluation of their ABM program, a group of ten scientists would conduct a parallel analysis of the potentialities of that program.46 This committee, headed by former DDR&E Assistant Director for Air Defense Hector Skifter and the President's Special Assistant for Science and Technology, George Kistiakowsky, was viewed by most observers as the key element in any future changes in the DOD view on the issue.

The second event of importance concerned the Secretary of Defense himself. Mr. McElroy, who had initially planned to resign in the Spring of 1959, had remained in DOD as the result of the death in May of his deputy, Donald Quarles. On December 2, however, McElroy did announce his resignation, and was replaced by his new deputy and former Navy Secretary, Thomas Gates. If the new Secretary did not yet have an understanding or opinion on the ABM question, the debate which was going on around him was soon to educate him as to the pros and cons of deployment.

Gates apparently had been paying close attention to portions of the argument regarding NIKE-ZEUS, and moved to secure additional information from his technical assistants. In a December meeting with DDR&E Director Herbert York and York's new Assistant Director for Air Defense, Dr. J. P. Ruina, the Secretary reviewed the WSEG analysis of the past winter and asked about that study's conclusions regarding the need for fallout shelters. Upon being told by his advisors that the "upwind

tactic" problem did indicate that shelters were a necessary precursor to a NIKE-ZEUS deployment around American cities, Gates replied that deployment therefore seemed out of the question. In his view, the public would never approve of the shelter idea, and thus there was no need to press the issue.47

The Army, disgruntled by the DOD response to their October production plan presentation and hopeful that the new Defense Secretary might prove more receptive to such a plan, continued to challenge those who opposed NIKE-ZEUS. In doing so, the Army raised important questions regarding the adequacy of the accepted strategic posture and the operational capabilities which that posture entailed. Realizing that the limited resources available for defense spending argued against administration funding of ABM on top of previously planned expenditures for offensive systems, ZEUS supporters questioned the validity of current strategic assumptions.

The basic philosophy of deterrence was one of the first things to come under attack. Complete reliance upon such a concept was both militarily and psychologically unsound, the Army argued, particularly for a nation whose policies rejected the option of our striking first.48 These ABM proponents further pointed out that the deterrence advocates

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47 Interview B. There was one interesting response to the McElroy ruling on ZEUS which may or may not have been noted by Gates. Taking a position quite opposed to that of the Air Force in general, North American Air Defense Command Chief General Lawrence S. Kuter (USAF) sided with the Army in asking that the $137 million be released. Jack Raymond, "Air Defense Head Backs Nike Zeus," New York Times, January 6, 1960.

48 Philip J. Klass, "Defense Group Evaluates Zeus Potential."
had themselves not really accepted the "offense-only" view. Had not the Air Force spent billions of dollars for air defense missiles, interceptors, and the SAGE system at a time when American superiority in bomber force capability was undeniable? Much in the same manner as they had argued for balanced resource allocation between nuclear and conventional military capabilities throughout the post-Korea years, the Army was asking that funding be provided not only for strategic offensive systems, but for strategic defensive systems as well.49

1960: TIME FOR A DEPLOYMENT DECISION?

As the administration prepared to present a new budget to Congress, there were a number of factors which could be read as being favorable to the Army drive for ABM deployment. If, as certain defense policy writers have argued, dramatic developments in the political environment can facilitate major policy shifts, the presidential campaign atmosphere of 1960 could be seen as a conducive situation for ABM supporters.50 Second, the Army stood on the threshold of its extensive testing program of actual NIKE-ZEUS hardware, and judicious publicity of successes in this endeavor could act to counter the DOD technical opposition to deployment.51

49 The Army's basic philosophy in both of these policy areas is described by former Chief of Staff General Maxwell Taylor in his The Uncertain Trumpet (New York: Harper & Row, 1959).

50 See Huntington, p. 291.

51 The first launch of a NIKE-ZEUS test model had taken place on December 19th at White Sands Missile Range, New Mexico. The vehicle included only the first two stages of the planned three-stage rocket, and only the first stage functioned properly.
The Defense Department, faced with both its own pessimistic technical assessment of NIKE-ZEUS and the President's desire to limit the overall size of the budget in an election year, included only $287 million for R&D for the system in the Army budget. Further, it was again announced by DOD that there were no plans to spend the $137 million pre-production authorization which had been included in the FY60 budget. The Army, armed with the fact that ZEUS had actually been test-fired and believing that the election environment could be used to their advantage in pushing ABM, prepared for a full-scale effort to sell the Congress on their plan.

Key Congressional Democrats did indeed plan to make Eisenhower defense spending a central campaign issue, and they did charge the Republicans with not committing adequate resources to strategic weapons systems. The Army, however, was not to benefit from this effort. The Democratic assault, led by Senate Majority Leader Lyndon Johnson and former Secretary of the Air Force and now Senator Stuart Symington, was very much a pro-offense campaign, and the question of ABM systems was rarely, if ever, mentioned.\footnote{Five different Congressional committees or subcommittees conducted probes of the administration's defense and space programs. See Jerry Greene, "Congress Has 5 Units Set to Sift Defense," New York Daily News, January 7, 1950.} When the question of Army budgetary levels did arise, the key issue was ground force modernization instead of NIKE-ZEUS.

However, the regularly scheduled Congressional hearings on the new budget did not completely ignore ABM, and the Army did have the opportunity to present its case in a number of these forums. In the meantime, that service sought to gain maximum publicity for its ongoing test series.
By early February, four NIKE-ZEUS test versions had been flight-tested at White Sands, with two of the flights rated at least partial successes. To test range telemetry gear and to demonstrate further the feasibility of missile interception, Army engineers also initiated a program of intercepts using shorter-range, already proven ground-to-air missiles. As a prelude to Army testimony before the House Space Committee, that service's R&D director, General Arthur Trudeau, publicized the first such test, in which a battlefield surface-to-surface rocket, an HONEST JOHN, was destroyed by an Army HAWK anti-aircraft missile.

While Trudeau and other Army spokesmen had previously limited their public reaction to the recent Eisenhower budget to the single issue of the $137 million pre-production fund, the House Space Committee was treated to a much stronger and more far-reaching argument. Both Secretary Brucker and Chief of Staff Lyman Lemnitzer called for a "crash" program for deployment, calling NIKE-ZEUS absolutely vital to the nation's defenses. Cognizant of the growing offensive "missile gap" argument voiced by Congressional Democrats, Lemnitzer stressed the role which ZEUS could play in maintaining offensive prowess: "If you are ever

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54 In this same news conference, Trudeau released two other pieces of technical information: 1. ZEUS, because of advanced nuclear kill mechanisms, did not actually have to strike the incoming RV physically. This was well understood in knowledgeable technical circles, but the public media had continued to misunderstand the phenomena involved. 2. An increase in radar range, comparable to "reading by a 40-watt light and (then by) a 200-watt light," had been gained. Ben Price, "General's Slip Indicates Plan to Foil Missiles," Washington Star, February 12, 1960.
going to be able, under (second-strike) circumstances, to use your offensive, you need to develop adequate defenses so that your offensive capabilities will not be wrecked by a surprise attack."\(^{55}\)

General Trudeau indicated that withholding of the $137 million fund alone would cause a six-to-nine month setback in the preparations for deployment. In his view, the only way in which the system could be operational prior to 1965 would be through the immediate initiation of a "Manhattan Project" type of crash program.\(^{56}\) The cost figures given at this time—in the $7-8 billion range—were somewhat below those given in 1959 testimony. In contrast to Trudeau's outspoken presentation, General Lemnitzer argued from a position more congruent with DOD assessments of NIKE-ZEUS capabilities. Even if the system does not provide near-perfect defense, the Chief of Staff said, the high levels of uncertainty involved in estimating strategic weapons performance make such an ABM a proper and valuable "low confidence" measure. Such an ABM, by providing a certain degree of effectiveness and by forcing an enemy to plan around its capabilities, was seen to constitute a wise allocation of defense resources.\(^{57}\)

In closing, Lemnitzer warned the Committee that failure to proceed with at least the pre-production funding would be a "serious mistake," and would leave the United States "stark naked" to ICBM attack in the late 1960's.\(^{58}\) The House committee, impressed by the Army's arguments, sought to prod the administration into a larger ABM program. In a letter

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\(^{57}\) Ibid.

to Eisenhower, the group's chairman, Representative Overton Brooks, asked that the $137 million be released. Meanwhile, the Army had approached DDR&E with a problem. Because the controversial $137 million had not been released, certain production capabilities for ABM system components had not been properly generated. In particular, the transistor industry was seen to be unprepared for the demand resulting from the proposed construction of the prototype NIKE-ZEUS battery on Kwajalein Island. In order to secure these parts in time to meet current schedules, the Army asked that an additional $25 million be released as soon as possible.

DDR&E’s Dr. York, who continued to voice serious doubt as to the future of the NIKE-ZEUS system, was not enthusiastic about funding the request. Because the components were needed as part of the development program, as opposed to any pre-production plan, he refused to use the $137 million as a source of money for the transistors. Instead, the Army was instructed to "find" the $25 million elsewhere, i.e. by juggling other R&D funding so as to break loose the necessary amount. As the initial round of Congressional hearings drew to a close, the advocates of NIKE-ZEUS had little to show for their efforts. The last remaining sources of potential support, in this budget cycle at least, were the appropriations committees.

59 Jack Raymond, "President Scores Charge He Misled U.S. on Defenses," New York Times, February 18, 1960. The steady stream of Democratic Congressional demands for increased defense spending which arrived at the White House in these months made it doubtful that the Brooks plea could have any special impact on the President.

60 For an indication of York's continuing opposition to ZEUS deployment, see John G. Norris, "York Raises Questions on Nike-Zeus," Washington Post, February 27, 1960. There is some indication that the DDR&E head agreed initially to take the $25 million from the $137 million, and that it was the Bureau of the Budget which refused to release that previous allocation for such a use. See Mark S. Watson, "Army's Zeus Fund Strikes Snags Again," Baltimore Sun, April 1, 1960.
Although General Trudeau and his aides made their case well, the appropriations committees accepted the administration's $287 million R&D budget for ZEUS without adding to it any of the pre-production funding sought by the Army. Dr. York, defending this policy to the House Defense Appropriations Subcommittee, made effective use of the "buy fallout shelters first" argument in countering pro-deployment testimony. While the Army's efforts to publicize ABM continued unabated, NIKE-ZEUS had lost another round.61 The administration, armed with the ever-present argument that ZEUS was technically unacceptable, was too deeply entangled in the political debate over offensive missile capability to pay much attention to the Army and its supporters. 1960, like the three years before it, saw the ABM deployment drive derailed by a combination of political, strategic, and technical issues.

THE PACIFIC ABM TESTS: TECHNICAL PLANS MAKE POLITICAL ISSUES

There was a second decision to be made regarding the ABM program in the Spring of 1960, and this issue generated (within the Defense Department, at least) as much debate as the deployment question itself. The point of contention was the Army's planned live test program for the integrated NIKE-ZEUS system, scheduled to take place on the Pacific Test

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Range in 1962. Because these tests had obvious implications for the kinds of performance capabilities which would in the future be associated with both ZEUS and U.S. offensive missiles, a number of organizations became involved. Given previous DOD experiences with interservice rivalries, the final outcome of this particular debate was both encouraging and unexpected.

The Army had begun construction of a complete ZEUS prototype battery on Kwajalein Atoll in the South Pacific, with completion scheduled for sometime late in 1961 or early in 1962. Realizing that the results of early ZEUS attempts to intercept incoming warheads at Kwajalein could be crucial to their arguments for rapid deployment of the system, the Army sought to gain control of both ends of the test program, i.e. both the ABM and the offensive missile systems. The plan suggested to achieve this goal was this: Launch Army JUPITER IRBMs from nearby Johnston Island, aim these rockets on a steep trajectory, and rotate the JUPITER vehicle back down toward Kwajalein while the booster was still burning, thus simulating the reentry speeds of the longer-range ICBM.

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62 Initially, the Atlantic Range (Cape Canaveral to Ascension Island) had also been considered. "Live" did not mean that either vehicle, offensive or defensive, would carry its proposed nuclear warhead. Instead, a small marking explosive in the ABM rocket would detonate and allow the miss distance to be calculated by radar tabulation. "Kill" evaluations would come from extrapolation of weapons effects data obtained through previous nuclear tests. The question of test validity under such simulated conditions would be a controversial one in later stages of the ABM debate.

63 Interview A, Interview B, Interview H.
Such a test program, one which was an all-Army operation, benefitted the Army in three major ways, only one of which appeared to be specifically related to the goal of maximization of progress in the U.S. ABM program. First, utilization of the IRBMs did mean that the tests could be initiated at an earlier date without the administrative delay associated with the alternative, i.e., a program using Air Force ICBMs launched from Vandenberg Air Force Base, California. 64 Given the kinds of animosities which the ABM issue had generated between these services, there were obvious grounds for questioning the ability of the two to coordinate the complete series of firings.

There were, however, two other motivations which prompted the Army to argue as it did, and both were related to that service's desire to strengthen its position vis-à-vis the Air Force. The DOD decisions of 1958-59 regarding offensive missile programs had opted for development—by the Air Force—of ICBMs (ATLAS and TITAN), as opposed to any large-scale deployment of IRBMs. While space applications continued to utilize a few of the Army's JUPITER IRBMs, long-term maintenance of that weapon system seemed doomed. By creating a requirement for the missile in the ABM testing plan, however, the Army hoped to keep the JUPITER production line operating. 65

64 The artificially created reentry velocity technique which the Army had in mind for the JUPITERs was thought by DDR&E to be an unrealistic simulation of ICBM flight. The ATLAS plan was seen to provide a more accurate and useful recreation of attack conditions.

The ongoing Army-Air Force argument regarding offensive missile penetration capability versus ABM discrimination capacity provided a second reason for the Army's position on the tests. While NIKE-ZEUS supporters had serious doubts as to the current ability of the Air Force to provide sophisticated penetration aids in operational form, there was always the chance that an Air Force ICBM launched toward Kwajalein might fool the ABM in some unexpected way. For the first series of tests at least, the Army realized the advantages of internal control of such things as RV design, reentry velocity, trajectory, and launch time.

Realization of the implications of the particular test plan proposed by the Army was not limited to that service, however. DDR&E reaction to the program design was both rapid and hostile. Herbert York, already suspicious of ZEUS' potential versus ICBMs, did not wish to see the Army reap the benefits of successful intercepts of less sophisticated missiles. Arguing that the threat was from ICBMs, the DDR&E director insisted that the test program operate against such systems. The differences of opinion between York and Army Secretary Brucker grew so serious that the Secretary of Defense asked the President's Science Advisory Committee to resolve the issue.

PSAC was given detailed technical briefings on both sides, with York and his assistant for Air Defense, J. P. Ruina, presenting the DDR&E view. Brucker, Army R&D head General Wood, and NIKE-ZEUS Project Officer Major C. J. LeVan explained the Army plan. The PSAC group chose the York plan, i.e., the one utilizing Air Force ATLAS ICBMs launched as part of that service's normal missile crew training program. The
Army, seeking to appeal the decision, asked that the PSAC recommendation be sent to the President for a final evaluation. Eisenhower, who had to be contacted in Hawaii, where he was visiting at the time, sided with the committee.\textsuperscript{66}

While Secretary Brucker had lost the battle, he had gained the assurances of DDR&E that the Air Force would not be allowed to sabotage the tests by using any unexpected tactics. Specific ground rules were laid out as to when and what kind of launches would take place. Both services were free to suggest test procedures, and the actual results of the Pacific test program indicate that from both a technical and administrative standpoint, the relationship worked well.\textsuperscript{67} Not only was ZEUS tested against a series of threats ranging from unsophisticated RVs to complex decoyed configurations, but the offense benefited too. The Air Force, through analysis of Army and ARPA telemetry data, was able to improve upon its own penaid development program. The two grand antagonists in the interservice fight over strategic weapons policy had cooperated, and the result was manifested in improvements in the technology of both offensive and defensive systems.

AN ADMINISTRATION ENDS, AND DECISIONS ARE DEFERRED

With the rigors of the FY61 budgetary debate behind them, DOD and Army officials turned in the summer of 1960 to various reassessments of the ABM question. Assistant Secretary of the Army for R&D Richard Morse,

\textsuperscript{66}Interview A. See also Watson, Ibid. It is interesting to note the utilization of PSAC in this case. These scientists, whose job it was to advise the President, were asked to assist in the settlement of an internal DOD matter.

\textsuperscript{67}Ibid., and Interview B.
with the approval of the Secretary of Defense, created a joint Army-DDR&E study group to examine future policy alternatives regarding ABM development and deployment. The "Ad Hoc Zeus Committee," as the group came to be called, approached the ABM issue in a somewhat broader sense than Army Secretary Brucker had done previously. The result was a quite different assessment of the objectives of the Army program and the benefits of alternative ABM policies for FY62.\footnote{There are indications that Mr. Brucker was unable or refused to seek alternatives to the kinds of full-scale deployment plans which the Army had sought in FY59, 60, and 61. The Army Secretary's position was not shared by men like Morse and Secretary Gates. Interview C, Interview H. Included in the Ad Hoc Zeus Committee's membership were DDR&E's York and the President's Science Advisor, Dr. George Kistiakowsky. See James Baar, "Nike-Zeus Now?", Missiles and Rockets, Vol. 8, January 30, 1961, p. 28.}

The conclusions reached by the Morse study included five general observations: (a) Administration approval of a full-scale ZEUS deployment would not be any more likely in late 1961 than it had been in three previous years; indeed, it could be viewed as even less likely, due to increased technological pessimism regarding systems performance. (b) For technological and managerial reasons, the tooling time—the delay between deployment decision and initiation of production—was a crucial matter. The learning process associated with the creation of such a complex production and quality control operation involved a substantial portion of the pre-production delay.

(c) The Ad Hoc Zeus Committee believed that national security needs, based upon uncertainty regarding Soviet weapons development, justified the kind of expenditures necessary to "tool up" a production capacity for
NIKE-ZEUS, even if actual production was later deferred. (d) This investment, because of its contribution to technical and managerial knowledge associated with administering such a program, would not be a waste of funds. (e) Finally, a limited number of operational ZEUS batteries, i.e., partial deployment, would yield better understanding of current ABM capabilities and would force the Soviet Union to deal with a new area of uncertainty, U.S. ABM performance, in their strategic planning and research efforts. 69

The Morse group concluded that a limited NIKE-ZEUS deployment plan, one which emphasized pre-production funding and a four batteries-per-year production rate, should be presented by the Army to Secretary Gates in November. In contrast to previous "full deployment" plans, this limited effort appeared to have at least partial support from DDR&E personnel. 70 From the standpoint of support from non-Army decision-makers within DOD, NIKE-ZEUS seemed somewhat closer to eliciting the long-sought "YES" answer from the administration, even if the limited deployment represented an obvious compromise when compared to earlier plans. Although Secretary Brucker appeared somewhat reluctant to propose a ZEUS program which called for less than full deployment, the Army adopted the committee's proposal.

69 The "Soviet reaction" argument was seen here in terms favorable to the U.S. If this country had a relative advantage in resources, it was deemed wise to force the Soviets to spend money on forces which they might otherwise not have procured. A counter-argument based on this same "Soviet reaction" is the arms race hypothesis which was later (1964-69) to become a central argument against ABM deployment. This latter view, however, was not present at this time.

70 Interview C. The "four batteries per year" concept was open-ended, specifying neither the desired final size of deployment nor the amount of technological advancement which could be incorporated into future production. See Payne Speech, p. 7.
In the weeks preceding formal presentation of the Army budget to DOD, a number of events occurred which affected the ABM issue. Within the DDR&E-ARPA community, three matters appear relevant. First Dr. York, who had suffered a serious heart attack in September, had become relatively inactive in DDR&E affairs. The technical arguments regarding NIKE-ZEUS' inadequate performance were carried on by DDR&E's Air Defense head, Dr. Ruina.  

Second, ARPA had generated a major effort—a follow-up to the earlier GLIPAR—designed to examine post-ZEUS ABM technology. Central to this study program was the belief that space-based ABM systems might represent the acceptable alternative to ZEUS-type ground-based systems.  

Third, U.S. intelligence estimates indicated an ever-increasing Soviet effort in R&D work associated with ABM systems. Russian testing of nuclear warheads, surface-to-air rockets, and air defense radars all pointed to a total level of commitment to ABM development which equaled or possibly even surpassed the U.S. The emergence of this information signified the initiation of a line of argument often described—and sometimes lamented—in defense policy literature. The presence of Soviet

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ABM capabilities led directly to a pro-ZEUS position based upon the "they have one, so we need one" observation. The unsteady and uncertain strategic environment surrounding the Geneva disarmament deliberations and nuclear testing moratorium generated fears of clandestine Soviet progress in nuclear technology, and this uncertainty fueled the drive for a greater U.S. effort in similar R&D.

When the "limited deployment" plan was finally presented to Secretary Gates, these uncertainties--plus the fact that the Eisenhower administration was now a lame duck establishment--militated against a response favorable to the Army. The alternative of passing the issue on to the new President was an attractive one, and the technical problems associated with ZEUS reinforced this option. Communications between the Army and Chief of Naval Operations Admiral Arleigh A. Burke did succeed in generating for the first time a JCS vote in favor of the ZEUS funding. Although this vote and the Army argument were conveyed to the President and his science advisor, Eisenhower chose again to reject ABM deployment. It was to be left to the incoming Kennedy administration to deal with this perplexing issue.

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74 See Congressman Overton Brooks' version of this argument in Furgurson, Ibid.

75 Richard Morse apparently convinced Burke to join Army General Lyman Lemnitzer in backing the plan. The vote was therefore 2 to 1, with Air Force Chief Thomas White still opposed. Interview C. See also Payne Speech, p. 8.
THE EISENHOWER YEARS: THE "ANTI-DEPLOYMENT" DECISION HAS MANY BASES

Chapter Two described the 1958 administration answer to the Army ABM deployment plan in terms of a number of factors which affected the outcome of that decision. As Chapter Three indicates, these same issues—political, technical, and strategic—again acted in concert to oppose NIKE-ZEUS. It is useful to review briefly the status of these variables and to indicate the changes which took place between mid-1958 and early 1961. In doing so, we may better trace the reasons for the "anti-deployment" decisions taken in these years.

A combination of increased understanding of high altitude nuclear weapons effects and the growing emphasis upon offensive decoys strengthened the anti-ZEUS arguments put forth by civilian technical personnel within the Defense Department. The "inventors' paradise" atmosphere, in which penetration aids were conjured up at a rate beyond what the Army could cope with (in terms of either hardware or arguments), unified the great majority of non-Army scientific opinion in opposition to ABM deployment. The major Army effort which sought to upset this line of argument was that service's publicity of the initial flight tests of the NIKE-ZEUS missile. This program, while demonstrating that the interceptor rocket could indeed fly, tended to be pushed into the background by the equally vocal arguments of the civilian scientists.

ABM deployment continued to imply changes in nuclear strategy which reinforced opposition to the Army plan. The accepted general war thinking remained deterrence-oriented as opposed to defense-oriented, and defensive systems were viewed as extravagances available only through much wider
resource commitments to national security. The burgeoning price tag and dubious effectiveness of the United States' major new defensive system, SAGE, merely reinforced the feeling that such expenditures should be closely scrutinized. Further, growing fear of Soviet offensive prowess—the attitudes which generated the "missile gap" of 1960—militated against defensive systems in any form other than those designed to protect our offensive threat. When the Army argued for ZEUS in this environment, it was often accused of doubting the credibility of the U.S. deterrent, and such a charge was an uncomfortable burden in the emotional defense budgeting debates of the late 1950's.

This description of the technical and strategic travails of ABM proponents in the final Eisenhower years appears capable of acceptably explaining the administration rejections of NIKE-ZEUS described thus far. The strength of these arguments, however, must be attributed as much to the political realities of the defense decision-making process as to any inherent "correctness" contained in the technical and strategic critiques of NIKE-ZEUS. As defense policy analysts have long realized, an argument's source must be considered to be of equal if not greater importance in such debate than are the arguments themselves.76

Chapter Two provided some insights into the kinds of political relationships which existed in the 1958 debate. We may conclude this examination of the Eisenhower years with a brief review of the status of various institutions and organizations which participated in the deployment issue's resolution and through such a review provide a base with which to compare and contrast the post-Eisenhower defense decision-making environment.

That centerpiece of the 1958 debate, interservice rivalry, manifested itself in various forms in the 1959-1961 era of the ABM issue. The Air Force, partially defeated by its loss of coequal status with the Army as an ABM developer, nonetheless demonstrated that it still maintained a powerful position in the defense budget allocation process. The central component of DOD funding continued to be the strategic offensive forces, and the Air Force, having dominated this sector of weaponry, benefited accordingly. The two most notable efforts by the Army in these years to challenge this Air Force ascendancy met with results which represented virtual Army defeats. The HERCULES-BOMARC question, while its resolution ostensibly favored the Army ABM program, was settled in a manner which effectively terminated the Army's larger production plans for its HERCULES anti-aircraft missile. The bitter controversy over the form of NIKE-ZEUS tests in the Pacific Range program saw the Army's last-ditch effort to maintain its JUPITER production capability fail. The DOD scientists, in choosing the ICBM alternative in this case, had again taken a position more favorable to the Air Force.

The civilian side of the Defense Department also viewed the strategic environment in terms more in harmony with Air Force perceptions than with those held by the Army. The creation in 1958 and 1959 of ARPA and DDR&E institutionalized the arguments of scientists and engineers who viewed ABM as infeasible at worst and impractical at best. Because this group of technical experts maintained—through DDR&E Director Herbert York—a direct advisory contact with the Secretary of Defense, the Army was forced to deal explicitly with the esoteric questions of decoys, radar blackout, and saturation. Without the benefit of external
rationales for ZEUS deployment (such as the presence of a Soviet ABM),
the Army faced a united front of ABM opponents who viewed the rapid
creation of a strong U.S. ICBM force as the first priority for action. 77

The political process is often viewed as a process of bargaining
and accommodation, and the relevant strategic and technical views of
the Army and the DOD civilians were enough opposed to one another to
suggest that the ABM deployment question might be approached through a
series of mutual adjustments. 78 The manner in which the Army presented
its arguments for NIKE-ZEUS, however, did not allow for such accommoda-
tion. On the contrary, Secretary Brucker's approach to the issue only
seemed to exacerbate the already existing differences between the two
groups. By demanding ZEUS production in an "all or nothing" fashion
and by trying to deemphasize the very technical issues which DDR&E
viewed as crucial to the question, the Army Secretary left little room
open for bargaining between his service and DOD. 79

77 See Peck and Scherer, p. 48, for discussion of the offense/defense
relationship in strategic perceptions.

78 See Neustadt, Presidential Power, and Lindblom, The Intelligence
of Democracy. For an analysis of another decision-making case which in-
vestigates the utility of the bargaining model, see Graham T. Allison,
Jr., "Policy, Process, and Politics: Conceptual Models and the Cuban
Missile Crisis." Unpublished doctoral thesis, Department of Government,
Harvard University, 1968. See especially chapters 6 and 7.

79 Internal compromise and accommodation can obviously take place
in the midst of a highly polarized public exchange generated to trans-
mit proper institutional images. Thus, the Army's public "hard line"
on ZEUS deployment did not automatically eliminate the opportunity for
accommodation between that service and DOD. However, Brucker was ada-
ment in his stance, even in Army circles. The Secretary's position,
while opposed by certain of his own subordinates, left no room for
compromise. Interview C, Interview H.
When the deployment question was carried beyond the DOD level, the Army faced still another set of obstacles resulting from institutional styles and values. As he approached defense policy decisions, President Eisenhower tended to utilize two techniques which acted against NIKE-ZEUS. In this area, as in others which involved the complexities of technology, he often referred the issue to his science advisor and the PSAC organization. The same issues which fostered DDR&E's opposition to ABM impressed Dr. Kistiakowsky and his scientific panels. They too saw NIKE-ZEUS as far too vulnerable to offensive penalties to warrant the kinds of expenditures sought by the Army.

The second Eisenhower trait relevant to the Army's dilemma involved the budgetary process. Arbitrary ceilings for spending were established, and competing programs were not subjected to any degree of detailed comparative analysis. Already pressured by the high costs of new strategic offensive weaponry, the ceiling system left little room for the billion dollar expenditures sought by the Army for ZEUS production. Even the $200-300 million R&D costs for ABM in this period constituted a squeeze on other Army programs, and indicated the secondary position of that service relative to the Air Force. Given the Army's inability to realize even minor funding victories in areas such as IRBM procurement or ground force modernization, its failure to secure administration support for the kind of expenditures associated with ABM deployment was understandable.

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81 The Army—DOD argument in 1960 over the need for $25 million for ABM transistor procurement provides an indication of the scarcity of funds for the Army program.
The moods and attitudes of the Congress and its constituencies also played a role in the negative decisions on NIKE-ZEUS. There is little to indicate that public opinion, that often-feared but frequently overestimated source of political influence, had crystallized on either side of the ABM question. The matter of strategic defense was far from central in most peoples' minds; indeed, the complexities of the new offensive forces had yet to be grasped by the man on the street. The Congress itself continued to exhibit mixed feelings regarding NIKE-ZEUS. On the one hand, many legislators sitting on defense-related committees viewed ABM development as a vital part of America's overall national security program. As we have seen, Congressmen on more than one occasion sought to elicit an increased resource commitment for ZEUS from the administration.

Acting in opposition to this desire for greater funding, however, was the traditional Congressional norm regarding economy. The kinds of expenditures required to maintain the U.S. deterrent in these years were by no means minor and the Appropriations Committees searched for areas where strict budgetary limits could partially offset these outlays. With the exception of legislative initiative in the matter of the FY1960 appropriation of the controversial $137 million pre-production fund, Congress tended to accept administration recommendations on ABM spending. Like the Defense Department, the military committees and subcommittees in both houses were much more inclined to view the strategic environment in Air Force terms (offensive systems, deterrence through retaliatory threat) than they were to accept Army statements regarding the feasibility of defensive systems and population protection.
The greatest Congressional challenge to the Eisenhower defense policies came in the pre-election environment of 1960. The events of these months provide a further indication of the degree to which the current strategic posture benefited the Air Force while tending to play down Army efforts to break into the strategic weapons business on a large scale. The entire "missile gap" argument focused upon U.S. ICBM force levels, and when the Army was mentioned at all in the Democratic Party's campaign efforts, the issue was modernization of ground forces, not ZEUS. The result of this absence of the ABM issue was not to the Army's advantage: In a heated political environment where the President was being bombarded with defense spending demands, the pro-ABM arguments were drowned out by the much more conspicuous criticisms voiced by offense-oriented Democrats.

Thus, while dramatic events in the political environment can act to generate the necessary support for funding of innovative weapons programs, ABM twice failed to benefit from such events in the Eisenhower years. Both the 1960 presidential campaign and the post-SPUTNIK defense policy revitalizations saw the Army hopeful that its ABM program would be approved. Instead, it was ABM's competitors, the Air Force's strategic offensive forces, which profited from the highly politicized debates. These resource commitments to ICBMs and strategic bombers merely reinforced the strength of the already-established posture of deterrence, a strategy in which the role of missile defense had not been accepted.

82 The only Army systems operating in the strategic force sector were the anti-aircraft NIKE-HERCULES missiles. By this time, the Air Force controlled the European-based Army-built JUPITER IRBMs.
In the budgetary debates of 1957 through 1961, the Army efforts to secure approval for ABM deployment had been unsuccessful for a multitude of reasons. While the supporters of NIKE-ZEUS could conceivably have overcome the technical objections to their new system, the political and strategic difficulties which added to their burden proved insurmountable in those years. The Army, already at a political disadvantage regarding Congressional support, had been forced to argue with not only the legislators, but with the Defense Department and the Air Force. In the absence of any significant public support or perceived crisis atmosphere, the Eisenhower administration was able to generate the necessary arguments to turn back the often eloquent and impassioned deployment rationales voiced by the Army. Even within the Joint Chiefs of Staff, it was not until late 1960 that the Army chief finally secured majority support for deployment, and this particular vote found the Air Force still opposed to the plan.

From the standpoint of those who opposed NIKE-ZEUS, the debate in these years had been relatively quiet. While certain aspects of the argument—notably the Army-DDR&E exchanges and portions of Congressional testimony—had been rather heated, the experience in the years to come would show that the technical, strategic, and political hindrances to the Army's goal of deployment would undergo great change. As ABM

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83 Deployment of a weapon system whose ultimate operational feasibility was highly uncertain or dubious would not have been unprecedented in any sense. See Peck and Scherer, The Weapons Acquisition Process, especially Chapters 2 and 11.
performance improved, as the concept of damage limitation attained a greater role in U.S. strategy, and as elements of U.S.-Soviet interaction became more obvious, the question of whether or not this country should build an ABM system became much more salient. The relative calm of the days in which the administration could say no to the Army and then assuage the Congress with a brief technical presentation was about to end. The new President had inherited an issue which would command ever-increasing attention in the 1960's.
CHAPTER IV

ABM IN TRANSITION: NEW POLICIES AND NEW TECHNOLOGY

The change in administration in January, 1961, brought with it a number of significant modifications in both the style and substance of American defense policy. President Kennedy's new Secretary of Defense, Robert S. McNamara, entered the Pentagon with a much different perception of the role of the Secretary in the management of national security affairs than his predecessors had possessed. In addition, the new president's election campaign had emphasized a desire to re-evaluate and modify the nuclear strategy and force structure maintained by the United States. The first six months of 1961 found the defense decision-making process altered in both of these ways: The political environment—the relationships among individuals and organizations—changed, as did the strategic posture.

In his State of the Union address, President Kennedy gave an indication of the scope of the reevaluation which he sought from Mr. McNamara:

I have...instructed the Secretary of Defense to reappraise our entire defense strategy—our ability to fulfill our commitments—the effectiveness, vulnerability, and disposal of our strategic bases, forces, and warning systems—the efficiency and economy of our operation and organization...and the adequacy, modernization and mobility of our present conventional and nuclear forces and weapons systems in the light of present and future dangers.1

The Defense Secretary was further instructed that military requirements, not arbitrary or predetermined budgetary ceilings, should constitute

the criteria for the size of our overall force structure. Once such requirements were developed, forces were to be procured at the lowest possible costs consonant with the levels of performance required.²

The Defense Department enjoyed at least a partial reprieve from the rigors of defense decision-making by virtue of the federal budgetary schedule. The outgoing administration had drawn up the FY62 budget in late 1960, and thus passed to McNamara and the Congress a plan which provided a base from which to operate. Pentagon planners were able to concentrate their efforts in those areas where significant modification was planned, and changes to these programs could come in the form of supplemental budgets submitted to Congress later in the year.

The main thrust of DOD's reevaluation took the form of four ad hoc study groups, each focusing upon a particular facet of defense posture.³ One of the groups, chaired by Assistant Secretary of Defense Paul Nitze, was specifically charged with the task of examining strategic weaponry and policy. One of the numerous programs reviewed by this committee was the Army's NIKE-ZEUS. As the tenor of the preceding election campaign indicated, the Nitze study concentrated more on questions of offensive capability than upon issues of strategic defense.


On March 1st, Secretary McNamara briefed the President and his staff on proposed additions and modifications to the Eisenhower defense budget. In that meeting, attended also by the President's Science Advisor and representatives of the Bureau of the Budget, a range of funding plans for NIKE-ZEUS was discussed.² While increases in the strategic weapons funding were central to McNamara's recommendations, ABM funding was not one of the programs which benefited. Indeed, the Secretary apparently suggested a reduction in the $258 million ZEUS R&D allocation asked by Eisenhower.³

Publicized statements in the preceding weeks indicated that ABM supporters clearly felt that release of not only the R&D money, but also the controversial $137 million pre-production fund, would be forthcoming from the Kennedy administration.⁶ Further press leaks indicated that the "limited production" plan, already squelched by the Eisenhower budget review the previous fall, was to be resubmitted to Kennedy for possible inclusion in the upcoming supplemental.⁷ Although the final decision of the March 1 meeting retained the $285 million ZEUS R&D fund already in the budget, the administration's failure to add to this sum represented a blow to the Army and its supporters.

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³Payne, Ibid.
⁷Norris, "Nike-Zeus Speedup..." The Army was highly optimistic, in part because of the more acceptable (to DOD) pricetag of a limited deployment, and also because the McNamara desire to "buy options" was seen as favorable to ABM procurement chances.
THE EVOLUTION OF NUCLEAR STRATEGY - THE EMERGENCE OF COUNTERFORCE
AND FLEXIBLE RESPONSE

The reevaluation of overall defense policies which preceded the March submission of the first Kennedy supplemental budget had significant ramifications for the question of ABM deployment. In general terms, the new administration criticized its predecessor for failing to provide adequately for effective military forces and capabilities associated with levels of conflict below that of strategic nuclear exchange. The Eisenhower philosophy that strategic nuclear forces could deter enemy aggression even at these lower levels of warfare was challenged on the grounds that a U.S. threat to respond massively to even the most limited types of military challenges would not constitute a credible deterrent. The concept of "flexible response," long supported by the Army, was put forth by Kennedy as a more adequate approach to the broad scale of possible conflict levels with which the United States might someday be confronted.

As for the strategic forces themselves, Kennedy and his aides were arguing that the Republican perception of "sufficient" force structure size was inadequate, given U.S. policy regarding use of nuclear weapons. If America vowed not to strike an enemy first, and if offensive forces were to be used not only to deter war through threat to enemy population, but also to limit damage to our population, then the kind of force

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structure maintained in the 1950's was becoming less and less capable of performing such a mission. The "counterforce" doctrine, which argued that deterrence was a function of a realistic war-fighting capability, gained growing support among key individuals in the new administration.9

Under the "war-fighting" assumptions of this new strategic concept, two key issues were second-strike capability (emphasis on survivability of strategic forces) and damage limitation through counterforce targeting of enemy offensive forces. If U.S. strategic weaponry was to be forced to absorb an enemy first strike, questions of early warning, alert status, hardening, and dispersal became central to force structure design. The kinds of attrition of U.S. offensive systems expected to result from Soviet counterforce targeting and air defense capability further required that a U.S. second strike force be significantly larger than a force unthreatened by surprise attack.

The idea of counterforce targeting--the utilization of one side's offensive forces to limit damage through attacking enemy offensive forces still on the ground in the homeland--required a further increase in the overall capability of the second-strike force. What was required was a strategic nuclear force capable of (a) absorbing a first strike and still being able to destroy a large enough portion of Soviet society to deter attack in the first place, and (b) providing enough surviving weapons to allow counterforce targeting against unlaunched enemy forces

9See Kaufmann, The McNamara Strategy, for a more detailed description of these revisions in nuclear strategy. Central to the benefits to be gained from such improvements in war-fighting potential was the opportunity for the U.S. to achieve nuclear war termination on terms more favorable to American objectives.
in addition to the counter-population capability. For a number of defense policy analysts, the Eisenhower strategic posture was lacking as a deterrent under second-strike conditions. While the size of that force appeared acceptable under non-attack circumstances, its adequacy as a deterrent was questionable once that force's destruction potential was assessed under conditions of Soviet surprise attack. 10

The specific program requests contained in President Kennedy's supplemental budget request of March 28, 1961, reflected the administration's desire to increase the capabilities of both the strategic offensive and limited war forces. The special budget message included a number of program reductions or cancellations in addition to increases, but the balance required an addition of $1.954 billion for FY62. Strategic offensive systems benefited most, with $1.34 billion going for additional POLARIS submarine production, $96 million for MINUTEMAN development, $50 million for SKYBOLT, and $44.6 million to increase the alert capabilities of the strategic bomber forces. Much to the chagrin of the Army, the text of the President's special budget message said nothing at all about NIKE-ZEUS or ballistic missile defense. 11

While defense allocations in the new budgetary process were ostensibly determined primarily by military requirements as opposed to economic considerations, there were obvious monetary constraints on the Kennedy increases in DOD programs. Given the increased outlays for

10 Ibid., pp. 52-53, 92-96, 148.
11 Raymond, "President Urges Missile Build-Up..." The non-nuclear limited war forces received an increase in support totaling $1.15 billion, much of which went to the Army. See also "'62 Military Requests Based in Large Part on Reports of Studies," Baltimore Sun, March 29, 1961.
strategic and conventional weaponry, the failure to accept the Army's plan for NIKE-ZEUS production funding was understandable. In the administration's listing of defense priorities, the untested and expensive ABM system was not blessed with high standing. While the first supplemental settled the deployment issue in the short run, it by no means quieted the debate. In the ongoing congressional hearings on the proposed FY62 budget, both the Army and DOD presented their views on ABM systems to an inquisitive group of legislators.

THE CONGRESSIONAL COMMITTEE AS DEBATE FORUM: A REvised ARMY VIEW

While the 1961 military affairs hearings before Congress give little insight into internal DOD decision processes, they do illuminate an interesting evolution of the Army's public presentation of its case for NIKE-ZEUS deployment. In this particular year, the context of the ABM debate, the underlying strategic and political perceptions of the protagonists, underwent a marked change. The result was that the legislative branch was treated to a debate which focused much more explicitly upon the strategic implications of weapons acquisition than had any previous budgetary formulation. In the process, the public record gained a new perspective on some of the individual and organizational beliefs within the administration regarding nuclear weaponry and the U.S.-Soviet strategic situation.

Central to the changes in the formal Army position on NIKE-ZEUS deployment was the realization that ABM was not yet a salient political issue. Traditional service statements regarding the "immediate military need" for new weapons were expected by the Armed Services Committees,
and yet the absence of any serious and widespread public demand for a ballistic missile defense made such arguments sound like so much military saber-rattling. The Army provided this argument in its customary form, stressing the possibility of Soviet ABM progress, the "naked" status of the nation without an ABM, and the serious "psychological disadvantages" (as per the SPUTNIK experience) to an ABM "gap." \(^\text{12}\)

Having provided its traditional kind of opening presentation to the congressional committees, the Army shifted to a milder form of argument. The lack of public sentiment for immediate deployment and the political impossibility of securing multi-billion dollar ABM funding in the absence of such attitudes prompted Army officials to seek a less massive commitment to NIKE-ZEUS. The Ad Hoc Zeus Committee's limited production recommendation of the previous fall had been received much more favorably in some DOD quarters than had previous "full" deployment plans. This type of small procurement plan had further attractiveness in that it fit the "open options" kind of weapons planning approach which Secretary McNamara had advocated. \(^\text{13}\) Political circumstances seemed to

\(^\text{12}\) Army Assistant Secretary for R&D Richard Morse stressed Soviet ABM work before the House Space Committee. See John W. Finney, "Army Aides Warn of Anti-ICBM Race," New York Times, February 18, 1961. Army Secretary Elvis Stahr, Chief of Staff George Decker, and R&D Chief Arthur Trudeau presented the "immediate need" view in other forms. See Military Posture Briefings, Hearings before the Committee on Armed Services, House of Representatives, 87th Cong., 1st Sess., January-February, 1961, p. 661 (Stahr), p. 671 (Decker--the SPUTNIK analogy was not lost on the committee), and p. 849 (Trudeau).

\(^\text{13}\) "Open options" referred to the maintenance of both R&D programs and actual operational capabilities allowing a wide range of military responses to future contingencies. The implication for NIKE-ZEUS was that the administration, while rejecting the idea of ABM production at the time, might desire to maintain a capability to produce such a system on short notice and/or to fund major R&D in an effort to improve upon current ABM technology.
favor continued Army backing of the "12 battery" plan, a program which emphasized cutting lead times and initiating production so as to preserve the capability to deploy rapidly should strategic or technological changes dictate such a move.

The Army had thus modified its basic position on ABM deployment. As a replacement for the earlier argument stressing the immediate necessity for full deployment, the service moved to a stance which viewed an operational NIKE-ZEUS system as inevitable and put forth a number of reasons why initial production should begin in FY62. Assistant Secretary of the Army Richard Morse repeated the observations of the Ad Hoc Zeus Committee, including the view that ZEUS deployment provided a useful (for the U.S.) function in that it forced the Soviets into penetration aid work not otherwise necessary. 14 Two new observations by Morse in the Armed Services hearings placed a limited ABM deployment in the context of two salient strategic circumstances of the time. In both cases, it was argued that NIKE-ZEUS provided a capability otherwise unavailable to the United States.

A popular nuclear war scenario in the 1958-60 period was one in which offensive weapons were launched against an enemy either by accident or through the unauthorized actions of a demented unit commander. 15 Such

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14 See supra, p. 102, and John W. Finney, "Army Aides Warn of Anti-ICBM Race," New York Times, February 18, 1961. Morse was one of the few Eisenhower-appointed holdovers in the Army hierarchy, and his direction of the Ad Hoc Zeus Committee added to his stature as the Army's top civilian spokesman on NIKE-ZEUS.

15 One of the first public appearances of this scenario was in "1970 Without Arms Control; Implications of Modern Weapons Technology," National Planning Association pamphlet no. 104, Washington, 1958. See also Kahn, On Thermonuclear War. Three popular works of fiction made use of the accidental war scenario: Peter Bryant's Red Alert, Eugene Burdick and Harvey Wheeler's Failsafe, and the screenplay Dr. Strangelove, by Stanley Kubrick.
occurrences were viewed as potential instigators of an uncontrollable sequence of events leading to total—and wholly unpremeditated—destruction of both sides. In advocating limited ZEUS deployment, the Army observed that even a small ABM system could counter such accidents, thus removing the necessity for this country to launch its offensive forces immediately upon receipt of warning of such attack.\textsuperscript{16}

The second argument tendered by Morse concerned ongoing efforts (which were quite important to President Kennedy) to secure a nuclear test ban and ultimate joint nuclear disarmament. One of the central fears associated with opposition to disarmament arose from the difficulties of policing such a ban. The presence of an ABM system was seen to provide an otherwise unavailable means of insuring that "cheating" would not be fatal to other parties. If a limited ABM deployment could be provided, the incentive for an enemy to renege on a missile ban by secretly building a few ICBMs would be greatly reduced.

Third, the Army R&D head addressed the most serious administration objections to the Army's NIKE-ZEUS, i.e., questionable technical performance and unacceptably high costs. Morse and his immediate superior, Secretary of the Army Elvis J. Stahr, provided further arguments directed at these two criticisms. Basing his position on the "inevitable ABM deployment" assumption which was an underlying Army belief, Morse addressed himself to the issue of the Pacific test program. Although

\textsuperscript{16} Finney, "Army Aides Warn of Anti-ICBM Race." It should be noted that the Army's argument here can hold only if one of the twelve batteries is in fact located in a position within range of the errant ICBM.
both the Eisenhower and Kennedy administrations had decided to defer any ZEUS deployment decisions until after this live test series had been completed, there was general consensus within the DOD technical community that NIKE-ZEUS would be successful against unsophisticated RVs. The Army R&D director began by accepting that view (that the Kwajalein tests would succeed) and argued that we should look beyond the tests to future strategic situations.

Repeating the Ad Hoc Zeus Committee recommendation, Morse cited as a prime U.S. objective--given Soviet offensive and defensive potential in the future--the goal of reducing lead time between ABM procurement decisions and operational capability. If DOD would accept their own statements that the Pacific tests would most likely succeed, they should not allow that program to delay other policy decisions. If McNamara would approve the original "limited production" plan, the tooling and assembly line work could begin immediately, thus cutting by up to two years the delay prior to ultimate operation once initial tests were completed.

This lead time argument provided the Army with a policy plan which conformed well with the administration's views on both the upcoming tests and the "open options" philosophy. The size of the suggested resource commitment also stood as a more realistic position in light of

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17 There was underway at the time a detailed DDR&E study which came to just this conclusion. See Payne Speech, p. 8.

18 Morse gave this testimony before the House Armed Services Committee in February. See Mark S. Watson, "Interceptor of Missiles Wins Support," Baltimore Sun, February 24, 1961.
the general feeling that ballistic missile defense was an unacceptably expensive proposition. By recommending an expenditure of less than $600 million for FY62, ABM proponents sought to minimize the impact of the cost argument. Secretary Stahr stressed too the side benefits of ABM technology, particularly in penetration aid study, but also in basic radar and computer systems. He argued that such gains themselves justified the initial ZEUS production expenditure, even if no further deployment was undertaken.19

In an effort to offset the economy arguments of those who saw an overall ABM deployment cost--some $7 to 15 billion--as unacceptable, Stahr noted that both Strategic Air Command and Continental Air Defense Command had cost in the neighborhood of $30 billion in the 1950's.20 By requesting a limited production plan requiring small initial expenditures and by comparing such a program with earlier costly strategic weaponry, NIKE-ZEUS supporters hoped to elicit an administration commitment for deployment without having to answer directly the criticisms concerning total systems cost.21

The change in the Army's position had been subtle yet significant. Led by its forceful Secretary, Wilbur Brucker, that service had in the 1957-1960 portion of the debate generated a categorical kind of argument which asserted that national security demanded a full and immediate

19 Military Posture Briefings, 1961, p. 715.

20 Ibid. The ten years costs included operating costs, an expenditure not included in the NIKE-ZEUS figures.

21 For a description of the Army plan and an examination of the ABM plans of the Air Force and Navy as presented to the House Space Committee, see James Baar, "Missile/Satellite Defense Debated," Missiles & Rockets, Vol. 8, February 27, 1961, pp. 77-79.
immediate NIKE-ZEUS deployment. Given the highly pessimistic DOD cost and performance estimates for ABM in those early years, this demanding kind of deployment presentation gained little support for the Army. While a number of capable and persuasive Army leaders, men like Generals Taylor and Gavin, impressed certain legislators with this approach, neither Eisenhower nor his defense advisors accepted the idea of ABM deployment.

Beginning with the Morse group, the Ad Hoc Zeus Committee, certain Army officials began to realize that the "all or nothing" kind of ZEUS argument was an inadequate tool in the budgetary debate. While this type of rhetoric was expected of the military by the Armed Services Committees, it was out of context in an internal DOD program allocation process where expenditures of this size (in excess of $5 billion over three to five years) could be justified only if they represented central implementations of administration defense policy. The current emphasis on strategic offensive systems was a reality that, regardless of their wishes, the Army could do little to change.

The Army had presented its case in a dual form, a form which indicated that services' growing awareness of the political and strategic difficulties inherent to their goal of securing deployment of their controversial NIKE-ZEUS. On the one hand, the Army Chief of Staff provided ammunition for strong ABM advocates in the Congress, arguing that the Soviet threat demanded immediate production of ZEUS.\(^{22}\) Realizing that

\(^{22}\) Throughout February and March of 1961, these Congressional advocates, led by Senators Thurmond and Russell and Congressmen Flood and McCormack, conducted an emotional drive to generate ABM support in both Houses. These men used as ammunition two special NIKE-ZEUS editions of pro-ABM magazines, editions filled with arguments for deployment. The
the administration support of ABM could come only if major DOD objections to the system were overcome or at least minimized, the Army presented a quite different argument to the Secretary of Defense. The strategic points cited above which were presented to the Congress represent part of this latter Army position.

The three major DOD objections to current ABM capabilities were each taken into consideration by the revised Army position. In answer to the argument that strategic defensive systems provided little in the form of security so long as they were of such low effectiveness, ZEUS supporters cited the "accidental launch" scenario and the utility of ABM systems in a disarmament process. The basic objections to the high costs of ZEUS were met by the concept of limited deployment. This idea of a slow, step-by-step process of ABM procurement also sought to handle the anti-ZEUS argument that the system had not yet shown its basic operational feasibility. The Army was saying that demonstration of such performance could be best attained by the construction of a few operational batteries.

January 30 Missiles & Rockets and the February 1 Army were quoted and recommended for study on the floors of both legislative groups. A passage from Daniel Flood's speech provides an indication of the tone of the campaign. He presented ZEUS as the answer to "the threat of a Red-triggered nuclear hailstorm," a threat which would leave the U.S. "naked, nuclear-weak in the diplomatic councils of the world." To deploy ZEUS, however, would move the nation "into the new frontiers of national and world security, (and would provide us with) the ballistic boxing gloves so desperately needed for defense against the ceaseless threat of communist worldwide aggression." See "Lobbying Activities Seen Aiding 'Influence' Spending," Washington Star, March 26, 1961. The "gap" argument was central to the positions of Flood and his supporters.
There was another facet of the DOD objection that ZEUS had not
ever proved its effectiveness, and ZEUS supporters constructed a series
of arguments to meet this particular criticism. The Army's problem
was to provide a rationale for initiating production prior to comple-
tion of the 1962 Pacific tests. Secretary Morse's argument concerning
the utility of reducing production lead time was addressed to this
point. In addition, Army publicity regarding the on-going test flights
of ZEUS and related defense missiles at White Sands and Point Mugu
helped to bolster the case for immediate ABM funding.23

KENNEDY AND McNAMARA SAY "NO" TO NIKE-ZEUS

The Army had provided the Defense Department with a set of argu-
ments designed to counter the most salient administration objections
to NIKE-ZEUS production. ABM supporters were optimistic that the combi-
nation of Kennedy's desire for "open options" and the less controversial
nature of the "limited deployment" concept would yield ZEUS procurement
funding in the March supplemental budget.24 There continued to exist,
however, a set of factors acting in concert to oppose the Army plan.
The foundations for these factors have been discussed above, and it is

23 For examples of such publicity, see Marvin Miles, "Nike-Zeus Tests Against Rockets Set," Los Angeles Times, March 22, 1961; and

24 See Norris, "Nike Zeus Speedup Plan...," and Raymond, "President Urges Missile Build-Up...," for indications of Army opinion and reactions to the administration's decisions.
useful to place these conditions in the context of this particular decision process.

The basic underlying objection to NIKE-ZEUS remained a technical one. DOD engineers had not changed their view, generally held since 1957, that current ABM technology was far too unsophisticated to be effective against future ICBMs. The two technical officials who had played key roles in earlier ABM debates, Herbert York and J. P. Ruina, were present in those first months of 1961, and were counted upon heavily by the new Defense Secretary to advise him on NIKE-ZEUS. Their positions remained that ZEUS' basic feasibility versus sophisticated threats was questionable, that the system's inability to provide an area defense made it much too costly, and that, these objections aside, no funding should be approved prior to the Kwajalein tests.25 The many uncertainties regarding system performance appeared quite persuasive to OSD personnel, and the Army's attempts to cope with these objections were generally unsuccessful.

The administration's reevaluation of strategic weaponry placed first priority on improvement of offensive capability in the strategic nuclear force structure. The programs bolstered by the March supplemental reflected the basic position of Kennedy and his advisors, the belief that immediate steps were necessary to correct deficiencies in both the

offensive missile and bomber forces. The new Congress indicated a
desire to fund such improvements, but it was questionable as to just
how great an increase in defense spending the legislators would accept.
NIKE-ZEUS therefore suffered both from lack of emphasis within the
framework of the strategic planning at the time and from the high costs
associated with the system's deployment.

Secretary McNamara brought to the hearings of the Appropriations
Committees an ambivalent kind of viewpoint regarding ABM deployment. On
the one hand, he appeared to have accepted Army arguments regarding the
utility of defensive systems, even if only partially effective, in the
uncertain environment of nuclear warfare. The Secretary echoed Richard
Morse's point regarding the impact of a U.S. ABM on Soviet actions:

Successful development (of NIKE-ZEUS) may force an
aggressor to expend additional resources to increase
his ICBM force. It would also make accurate estimates
of our defensive capabilities more difficult for a
potential enemy and complicate the achievement of a
successful attack. Furthermore, the protection that
it would provide, even if for only a portion of our
population, would be better than none at all.

In evaluating the technical assessments of ZEUS provided by his DDR&E
and ARPA advisors, the Secretary took the view that a deployment at the
present time would be premature, and that a more desirable course of
action would be to wait until the development program--including the

26 The recommendations for the programs contained in the supplement
came in large part from the conclusions of the Nitze task study and the
three other DOD study groups initiated by McNamara in early 1961. The
Nitze group did not deal with the ABM issue to any extent. See
"'62 Military Requests Based in Large Part on Reports of Studies,"

27 DOD Appropriations for 1962, Subcommittee on Defense Appropriations,
House of Representatives, 87th Cong., 1st Sess., April, 1961,
Part 3, pp. 16-17.
Kwajalein testing series--was completed before making a decision. The key technical issues of discrimination of decoys and saturation by numerous incoming radar images continued to constitute the basis for this technical skepticism:

There is still considerable uncertainty as to (NIKE-ZEUS) technical feasibility, and even if successfully developed, there are many serious operating problems yet to be solved. The system itself is vulnerable to ballistic missile attack, and its effectiveness could be degraded by the use of more sophisticated ICBM's screened by multiple decoys. Saturation of the target is another possibility, as ICBM's become easier and cheaper to produce in coming years.28

The implication in this presentation to the House Defense Appropriations Subcommittee was that ZEUS deployment could wait until the 1962 Pacific tests demonstrated a satisfactory level of system performance. In his testimony to the corresponding Senate group, McNamara went even further in questioning the advisability of procuring the Army system. He was quite pessimistic regarding not only the immediate issue of ZEUS production, but also the ultimate operational feasibility of that particular system.29 Noting that the development costs alone for the program would total some $1.75 billion by the time the Pacific tests were completed, the Secretary challenged the costs of NIKE-ZEUS: "It is a very expensive system in relation to the degree of protection that it can furnish."30

28Ibid., p. 17. The reference to the "system itself" indicates that the ZEUS radars were "soft," i.e., vulnerable to even low levels of blast overpressure generated by nuclear detonations.

29DOD Appropriations for 1962, Subcommittee on Defense Appropriations, U.S. Senate, 87th Cong., 1st Sess., April, 1961, p. 23. The fallout shelter issue, for many officials a major roadblock to ZEUS funding, did not receive much attention in the 1961 hearings.

In its final form, the FY1962 budget included the $276 million ZEUS R&D fund agreed upon by both DOD and the Army. No pre-production or production monies were added by either Congress or the administration, and the FY60 allocation of $137 million for pre-production continued to be withheld by the White House. The Berlin crisis in July of 1961 led the administration to request a second supplemental defense appropriation, but the question of NIKE-ZEUS was not an issue. This request for an additional $3.454 billion did include a $207 million fallout shelter plan—a program which the President himself strongly favored—and funds for improvements in the Air Force's strategic bomber program, but the major emphasis was on strengthening tactical, not strategic, forces.31

The technical failings and high costs of NIKE-ZEUS in 1961 reinforced the Kennedy Administration's feeling that defensive systems were not as yet capable of contributing to national security to a degree commensurate with their costs. So long as ICBMs were vulnerable only to other offensive systems, nuclear strategy was dependent upon offensive weaponry for both deterrent and defensive roles. In spite of the concerted efforts of ABM advocates in the Congress, NIKE-ZEUS failed to become a politically important issue in the sense that neither the legislative branch nor the general public appeared overly concerned about the deployment question. The Kennedy Administration did, however, continue to support fully the R&D phase of the Army program and also funded more basic missile defense research by ARPA.

THE EVOLUTION OF ABM TECHNOLOGY: SOME OLD PROBLEMS ARE CHALLENGED

Central to the administration argument against NIKE-ZEUS was the issue of technological uncertainty as to the basic ABM capabilities of the current Army system. While it remained for the live Pacific tests to demonstrate the feasibility or non-feasibility of certain ABM concepts, other technical developments in 1960 and 1961 answered important questions regarding the general issue of ballistic missile defense. The ABM debate in this first year of the Kennedy presidency, and in the years to follow, was characterized by arguments which related different system performance capabilities to differing enemy threats. The result of such debate was that the protagonists often talked past one another. Although agreement may have existed as to the potential performance of a particular kind of ABM deployment versus a specified threat, such complementary assessments were lost in the fray. Because meaningful evaluations of ABM performance are so sensitive to assumptions about the nature of both the defensive system and the offensive threat, the following review of technological developments in the 1960-1961 period will emphasize the relationship between such developments and specific strategic scenarios.

By the time the Nitze study group examined the NIKE-ZEUS issue in 1961, the Army had achieved a number of improvements in ABM systems components. The development and testing program at White Sands Missile Range yielded a number of successful firings of the first two stages of the ZEUS missile, and static tests of the third stage had been completed. 32

Test launches of the full three-stage ZEUS prototype required a transfer of the program to Pt. Mugu, California, where the Pacific Ocean provided a large enough range for such firings. The speed of the interceptor missile itself underwent a marked improvement, gaining by a factor of approximately one-third. This development benefited overall system performance in that it allowed the radars more tracking time, thus facilitating discrimination of the real RV prior to ZEUS launch.33

A number of other technical developments aided the radar and computation portions of the system, and generated important improvements in radar range and sensitivity. Included were a new low-noise receiver, a signal compressor device, and advances in klystron power and Luneberg lens technology.34 The capability to generate more accurate radar images at longer ranges led ZEUS developers to believe that the "discrimination" radar could actually distinguish between warheads and decoys prior to the point at which the RV began to reenter the atmosphere. These general system improvements, while representing significant advances in the state of the art, did not solve the saturation and discrimination problems which had plagued NIKE-ZEUS since its inception.

As earlier sections of this chapter indicate, the public and congressional parts of the deployment debate gave little indication of the status of the technical problems associated with ABM performance. The Army was

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understandably optimistic as to its ability to solve the decoy and traffic-handling (saturation) problems through future development, and rarely, if ever, distinguished between current ZEUS capabilities and the service's hopes for future improvements in that performance. Within the Department of Defense, however, technical analyses did indicate in specific terms the conditions under which the Army's proposed ABM system would or would not carry out its mission adequately.

Early in 1961, Secretary McNamara requested a DDR&E assessment of the Army's ABM program. Submitted to OSD in April, this report underscored the differences between an unsophisticated threat arriving on target one or a few at a time and a more advanced enemy offense which carried decoys and could institute salvo launches. In the words of the DDR&E study:

Assessment of...NIKE-ZEUS...gives us a high confidence that a (sic) low-rate-of-arrival targets can be effectively destroyed. The bleak outlook arises because of the enemy ability, through the use of penetration aids (decoys, low radar cross-section warheads, multiple warheads) to insure our destruction at a cheaper cost to himself than it costs us to counter his move....

Directly addressing itself to the saturation issue, the report noted that the concept of phased array radars was almost at the point of application. If feasible, this totally different type of radar would provide a solution to one of ZEUS' most serious limitations, the inability of a single mechanically turned ABM radar to track more than one or a few incoming objects at any one time.

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35 Payne Speech, p. 8.
36 Ibid.
Phased array radars utilized hundreds or even thousands of small radar units arranged in large non-rotating grids. The use of these multiple, electronically steered subradars eliminated three serious problems of the old systems. Because scanning was performed electronically instead of mechanically, and because the single radar beam was replaced by a multitude of such beams, the new technology allowed simultaneous tracking of multiple incoming objects.\(^{37}\) Able to look in many directions and focus upon many different objects in a matter of microseconds, phased array systems represented a qualitative jump beyond the capabilities of the slow-moving mechanically-rotated ZEUS Acquisition Radar (ZAR).

Because various segments of the radar array could perform different functions, the new system also removed the necessity to use two separate units for signal transmission and reception, as was required with the ZAR; the single radar could perform both functions. In addition, the fact that the array did not have to be physically rotated allowed the entire unit to be built with a significant resistance to blast effects. Unlike the "soft" ZAR unit with its exposed discs and moving parts, the phased array could be hardened so as to make it much less vulnerable to enemy nuclear bursts.

While phased array technology had been under study at Sylvania since 1959, the Army had not wanted to attempt incorporation of a new long lead time sub-system in its NIKE-ZEUS program. In addition to this factor stemming from Army wishes for a rapid deployment decision, acceptance

\(^{37}\) Fink Speech, pp. 4-5.
of the new radar had been hindered for another reason. The main NIKE-ZEUS contractor, Bell Laboratories-Western Electric, had no desire to see the radars which they themselves developed bypassed in favor of a system built by a competing electronics firm. Only after DDR&E personnel formally requested the Army to do so did the ABM program institute a ZEUS-oriented phased array development effort.\textsuperscript{38} This effort, initiated in June, 1961, was funded through the basic Army ABM R&D appropriation.

As indicated by the conclusions of the April DDR&E report to McNamara, the decoy-discrimination problem represented the most serious drawback of NIKE-ZEUS. Information made available to certain military affairs reporters in conjunction with preparation for the 1962 Pacific test series at Kwajalein provides an indication of the status of this particular technical issue. While some Army press releases implied otherwise, NIKE-ZEUS technology continued to be dependent upon the atmosphere to provide a sorting function prior to discrimination.\textsuperscript{39} Even for the most unsophisticated decoys such as chaff, balloons, and booster fragments, it was necessary for ground controllers to wait until the incoming objects were within 50 to 100 miles of their target before launching the ZEUS missiles.

This dependence upon establishing a differential velocity for re-entering objects made it impossible for ZEUS to perform the interception

\textsuperscript{38} Payne Speech, p. 9; and James Trainor, "ZEUS May Get Array Radar System," Missiles & Rockets, January 22, 1962, p. 29.

\textsuperscript{39} For an example of Army optimism regarding the discrimination issue, see Dennis Burrow, "Army Believes Nike-Zeus Solves Anti-Missile Needs."
mission with any confidence at altitudes above 100 miles. When knowledgeable Army personnel spoke of their system's ability to discriminate, they referred specifically to only the lightest kinds of decoys. For more deceptive pen aids, there simply was not enough time available between positive discrimination and RV arrival on target to allow the relatively slow ZEUS to perform a successful intercept. Because of this difficulty, the basic method of discrimination, speed differential observation, became all but impossible. The one possible solution which the Army mentioned was that the ABM missile would actually be fired prior to discrimination and then guided to the real target in the last few seconds of its flight.41

Two other possible tactics regarding the discrimination problem had already been shown to be implausible at the time. While NIKE-ZEUS could simply fire an interceptor at each and every possible warhead under circumstances where attack volume was light, such a policy would make the ABM system highly vulnerable to multiple-decoy, staggered-launch attacks. Furthermore, this conscious refusal to attempt discrimination among objects merely exacerbated the saturation problem. The second technique involved solving the decoy problem with a different brute force method. If the groups of reentering objects were sufficiently clustered, and if the ZEUS warhead was powerful enough, the ABM system could conceivably "kill" the entire cloud of objects, warheads and decoys, with well-placed single blasts.


41Ibid.
Because the interception took place within the atmosphere, a major portion of the ABM nuclear warhead's energy would be transmitted in the form of blast. Information leaked to reporters at Kwajalein indicated that the maximum "miss distance" allowable for ZEUS, given the strength of this blast effect, was somewhere between 300 and 750 feet.\textsuperscript{42} Decoys could be ejected from RVs so as to create a cloud of objects much larger than the 600-1500 foot circle associated with such a kill radius, thus making this potential answer to the discrimination problem impractical given current technology. So long as interception took place within the atmosphere, NIKE-ZEUS was shackled with relatively small kill radii and continued to be vulnerable to offensive penetration aids.\textsuperscript{43}

The DOD technical community, alarmed both by the problems inherent in the ZEUS system and by intelligence indications of increased Soviet ABM R&D, initiated a number of new programs dealing with the offense-defense interaction in missile warfare. ARPA contracted for radars and communications installations on the Pacific Test Range under its Project PRESS, Pacific Range Electromagnetic Signature Study. PRESS was designed

\textsuperscript{42}Ibid.

\textsuperscript{43}The two major constraints which dictated such a condition were inherent to the weapons involved. Because RVs were provided with heavy shielding to allow atmospheric reentry, they were protected from blast damage from all but the closest ABM bursts. Blast effects in the atmosphere increase as a function of the cube root of the yield. The option of increasing the power of the ZEUS warhead thus adds relatively little to the blast kill potential of the ABM system. For example, an increase in yield from 50 kilotons to one megaton (a factor of 20) would extend the ABM kill radius only by a factor of approximately 2.7. See AEC Handbook (1962), p. 127. In addition, such ABM warhead increases merely exacerbate the "self-blackout" problem, i.e., the damaging effects on ABM radars generated by ABM warhead detonations.
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to provide information for both the Army and the Air Force regarding the images formed on radar and other sensing devices when RVs and decoys traveled on ballistic trajectories. This data would assist the ABM program by providing clues for decoy discrimination, and would benefit the U.S. ICBM program by indicating the degree to which various penetration aids were successful in confusing detection systems.

ARPA also funded a number of study contracts which had evolved from the earlier GLIPAR investigation of advanced concepts for ballistic missile defense. The two most popular alternatives to the ZEUS-type system were a "shotgun" ABM and a satellite-based weapon. Raytheon's project ARPAT was the leading proponent of the former method, a system designed to fire a cluster of dart-like projectiles from single interceptor missiles. These darts would "fan out in all directions, home in on a great number of attacking missiles, and achieve multiple kills."[^44]

While ARPAT sought to handle the saturation and discrimination problems by brute force, the satellite systems took a different approach.

A number of alternative plans, including the Air Force's Bambi ("Ballistic Missile Boost Intercept"), Convair's SPAD, and RCA's SAINT, sought to intercept ICBMs prior to the terminal phases of their flight paths.[^45] By attacking enemy missiles prior to the time at which they


dispersed decoys, satellite-based ABMs hoped to preempt entirely the offense's use of pen aids. The large numbers of ABM-launching satellites and extremely high system performance reliabilities needed for such weapons yielded unacceptably high costs, however. As a result, research on these systems was basically limited to development of concepts and analysis of the necessary components.

By mid-1961, the Army was quite confident that NIKE-ZEUS could maintain a high level of effectiveness against existing Soviet ICBMs. DOD, while accepting ZEUS' effectiveness versus unsophisticated enemy forces, believed that the threat in the mid-1960's (the time at which a U.S. ABM would become operational) would be a much more highly developed one, involving ICBMs equipped with complex penetration aids. The prospects of phased array radar development led to optimism by both the Army and DOD that many of the old ZEUS' problems could be solved, but differential assessments of future decoy capabilities fostered a continuing and heated argument regarding the nature of the attack environment in which an ABM would operate. As if these differences were not enough to maintain the Army-DOD debate, other events were soon to insure continued antagonism between the two organizations over ABM policy.

PRELUDE TO RENEWED DEBATE: SOVIET ACTIONS MODIFY THE STRATEGIC SITUATION

A number of strategic and political considerations in the summer of 1961 combined to alter the administration's perspective regarding strategic defense. Even prior to the Berlin crisis, indications of Soviet ABM progress had caused concern in some quarters that the United
States' voluntary nuclear testing moratorium was impeding American development of similar weapons. As tensions rose as a result of Russian demands regarding Berlin, pressures on President Kennedy to resume testing grew. Among the most vocal proponents of such a move were key members of congressional committees on atomic energy and military affairs.46

In addition to the general tension surrounding the Berlin situation, two other issues contributed to the feeling on the part of these men that the United States should end its self-imposed moratorium. In the thirty-two months which had transpired between the initiation of the Geneva test ban negotiations and June, 1961, little progress had been made toward establishing mutually acceptable ground rules for policing a formal test cessation.47 High uncertainty regarding U.S. capabilities to detect clandestine testing violations by the Soviets during the moratorium led to Congressional fears that the latter nation had secretly jumped far ahead of the U.S. in nuclear weapons technology. ABM warhead design and radar blackout phenomena investigation were only a part of a wide range of nuclear technology where key legislators feared serious U.S. lags vis-à-vis Soviet knowledge.

By late August, these fears, coupled with the heightened crisis atmosphere in Berlin, resulted in increased pressures on the President:


47 Initiated in conjunction with Soviet and U.S. voluntary test cessations, the Geneva talks had been in session since October 31, 1958. See Jacobson and Stein, Chapter 4.
to terminate the moratorium. Democratic legislators, having successfully steered Kennedy's supplemental defense budget through some Republican resistance, called on the White House to resume testing. The issue was settled in a somewhat unexpected manner on August 31 when the Soviet Union announced that it was resuming nuclear testing on its own accord, having been prompted, it said, by the U.S. military response (reserve calls and increased budget) to the situation in Berlin. On September 5, Kennedy responded by announcing that the United States too would resume testing sometime in 1961. High on the list of priorities in these tests would be ABM-related blasts.

As the United States began preparations for a series of underground nuclear tests, the Soviets conducted a number of atmospheric tests, one of which took on major strategic significance. While the first Russian atmospheric test which U.S. scientists detected took place on September 1, it was a detonation five days later, near the Aral Sea, which had widespread ramifications regarding the ABM issue. The September 6 test, exploded at an altitude of some 200,000 feet, was initially reported in

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48 Representative Holifield renewed his plea and was reinforced by such men as Senators Symington and Stennis (both key Armed Services Committee members) and former AEC Chairman Admiral Lewis Strauss. See "3 Advocate Go-Ahead on Atomic Tests," New York Herald Tribune, August 21, 1961; and "Strauss Asks U.S. to End Test Ban Pact," Washington Star, August 28, 1961.


the American press as simply an "ABM-related" shot.\textsuperscript{51} Within the DOD community, however, it was known that the Soviet explosion had come from a live firing of a nuclear ABM warhead launched against a reentering RV. Furthermore, intelligence indicated that the intercept had been successful, i.e., the RV had been destroyed.\textsuperscript{52}

Information concerning this particular Soviet nuclear test led to fears in some quarters that administration reluctance to fund NIKE-ZEUS could result in a sort of "ABM gap." This fear of an important Soviet advantage in strategic weaponry reinforced the basic Army belief that national security dictated a production go-ahead on ABM immediately, without waiting for the results of the U.S. test program scheduled for 1962.\textsuperscript{53} In late October, the Soviets themselves fueled the argument by proclaiming success in their own ABM development program. Defense Minister Rodion Malinovsky told the 22nd CPSU Congress that Russian ABMs were now prepared for U.S. ICBMs.\textsuperscript{54} As Defense Department officials began to examine NIKE-ZEUS in conjunction with the preparation of the FY1963 budget, the strategic and political ramifications of Soviet ABM advances represented manifest counter-arguments to the previously dominant technological criticisms of the Army plan.


\textsuperscript{52} Lloyd Norman, "NIKE-X," \textit{Army}, March, 1967, p. 28.


\textsuperscript{54} John Miller, "Antimissile Arm Built, Soviet Says," \textit{Washington Post} October 24, 1961. Moscow radio's follow-up broadcast went even further regarding the status of Soviet ABM systems. Clearly implying operational
THE FY63 BUDGET FORMULATION: NIKE-ZEUS RECEIVES McNAMARA'S SUPPORT

As the ABM issue once again approached that point in the budgetary process where the President and his advisors addressed the deployment question in conjunction with their general fiscal planning, the environment of the debate had changed in numerous ways. The new administration, in the first budget which was wholly its own, sought to keep a number of options open. DOD technical assessments of NIKE-ZEUS remained highly pessimistic, but arguments for less-than-full deployments were received with somewhat less criticism than before. The possibility of rapid Soviet advancement in ABM technology had made the ZEUS deployment decision more prominent, and Republican sources had already hinted that the Democrats might find the "gap" argument turned against them in this case. 55

Newly appointed DDR&E Director Harold Brown had instituted a second technical study of the NIKE-ZEUS program in the summer of 1961 for the purpose of providing current information for Secretary McNamara in the fall budget formulation. A group headed by ARPA Director J. P. Ruina submitted this report to OSD in September, and PSAC was briefed on the matter the following month. Given the fact that the technological status of the Army program had not undergone any significant change since 55

capability for these weapons, the newscast claimed that "there is an anti-missile for every single (U.S. offensive) missile," See "Soviét Union Claims 100-Megaton Warhead, Emphasizes Anti-Missile," Aviation Week and Space Technology, Vol. 75, November 27, 1961, p. 23.

55 For an example of this "ABM gap" argument, see "Biggest Arms Race — The One Russia May be Winning," U.S. News & World Report.
April, the DDR&E analysis again recommended against a production decision in 1961. Central to this pessimistic assessment were the ongoing observations of ZEUS' low rate of fire, limited traffic handling capability, and inability to utilize atmospheric discrimination techniques.  

The report also provided an explicit performance evaluation of NIKE-ZEUS versus alternative levels of offensive sophistication. This portion of the analysis formed a key part of the rationale associated with DDR&E's opposition to deployment in FY63. The current ABM system was seen to be:

a. Effective against missiles not equipped with penetration aids, including such weapons and the A through D series ATLAS, early TITAN configurations, MINUTEMAN I, and the POLARIS A-1 and A-2.

b. Marginal against missiles equipped with minimum penetration aids, including ATLAS E, MINUTEMAN with high-beta RVs, and penaid-equipped versions of TITAN.

c. Ineffective against missiles with appreciable payload allocated to penaids, or against attacks using extremely high megatonnage precursor blasts.  

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56 Interview D. The study confirmed that the relative slow ZEUS did have to be fired while incoming were still above the atmosphere.

57 Interview D, Interview E. "Low beta" (ballistic coefficient) indicates a low-velocity RV. Penetration capability was enhanced by the development of high-beta RVs, nosecones with small surface areas and cross sections. The added speed of such RVs shortened the time during which an ABM could perform the discrimination and interception tasks. On the other hand, faster RVs complicated the decoy design task, in that it was more difficult to develop light-weight decoys which could simulate the added speed.
Because the general DOD feeling was that 1966-70 enemy ICBM forces would be in the range of decoy sophistication associated with types b and c above, this study concluded that current ZEUS technology was inadequate and should not be made operational. However, the analysis did indicate that a combination of two major technological advances could greatly enhance ABM capabilities. The first advance, phased array radar, had been discussed earlier in the April DDR&E ABM assessment, and the Army had already initiated an R&D project on such a system. The second improvement called for a new short-range, very high acceleration ABM missile which could, by virtue of its great speed, wait until an RV had passed through enough of the atmosphere to allow radar discrimination prior to launch of the interceptor. This missile concept, called SPRINT, had been brought to DOD's attention by engineers at Bell Laboratories.\(^58\)

As early as mid-October it was evident that Secretary McNamara favored some sort of limited production of NIKE-ZEUS. Faced with pressing funding questions regarding a number of complex new weapon systems (the B-70, SKYBOLT, and DYNASOAR, in addition to ZEUS), OSD sought to keep numerous options open, at least to the extent of funding pre-production plans. Apparently persuaded by his deputy, Cyrus Vance, to take such a step, McNamara accepted the utility of limited production funding for the Army program.\(^59\) Central to the Secretary's assessment that ABM

\(^{58}\) Payne Speech, p. 9.

\(^{59}\) Interview C, Interview E, Interview F.
production should begin in FY63 was the belief that phased array and SPRINT technology could allow the initially small ZEUS deployment to evolve into a less expensive and more effective terminal defense system in later years.\textsuperscript{60}

The Army's budget recommendatoin for NIKE-ZEUS went to McNamara in early November, and again reflected the conclusions of the Ad Hoc Zeus Committee's 1960 study. Specifically, a limited deployment of twelve ZEUS batteries was postulated, with a total cost of approximately $3 billion over five years. The OSD staff generated an FY63 expenditure range based on this plan which required a $100-150 million production fund to keep the later "full procurement" option open.\textsuperscript{61} The Army continued to talk in terms of FY63 allocations as being simply the first installment in the 12-battery deployment plan, while McNamara viewed the initial expenditure only as a means to insure that the program would be sufficiently developed if and when OSD later (i.e., in 1962 or 1963) decided to fund a full deployment.

In anticipating a favorable ZEUS ruling by the Secretary of Defense, the Army publicly expressed the kind of pre-decision optimism characteristic of the services in such circumstances.\textsuperscript{62} This, plus the fact that publicly leaked versions of DOD's "Continental Defense"

\textsuperscript{60}See Richard Fryklund, "Pentagon is Studying New Anti-ICBM Missile," Washington Star, November 12, 1961. System cost reductions were projected in light of a cheaper missile (SPRINT) and phased array technology's allowance of less radar units per battery.

\textsuperscript{61}Payne Speech, p. 10.

budget package contained the ZEUS funding in its original Army "12 battery" form, led many observers to believe that McNamara would take to the President an ABM recommendation very much in line with Army wishes. When questioned as to what he would suggest to Kennedy regarding ABM funding, the Secretary told a news conference that the planned November 21st test at Pt. Mugu of the first full three-stage ZEUS represented a key variable. When that test was carried out successfully, the feeling that the Army had won its battle was reinforced.

The issue was formally dealt with by the President in a series of budget planning meetings at Hyannisport during the Thanksgiving holidays. On November 22, a detailed ABM briefing was presented by Harold Brown (DDR&E), J. P. Ruina (ARPA), and the representative of the Department of the Army, ZEUS Project Officer Major C. J. Levan. Included in the presentation was discussion of not only the current Army plan, but also the future possibilities of technological advances regarding phased array and SPRINT developments. Key presidential advisors in attendance split on the issue, and did so along anticipated lines. Strongly supporting the Army plan were JCS Chairman General Lyman Lemnitzer and special military advisor to the President General Maxwell Taylor. Quickly dissenting on the recommendation was Kennedy's science advisor

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64 See "McNamara Approves 12..." ibid.

65 Interview A, Interview D, Interview G.
and PSAC chairman Jerome B. Wiesner.\textsuperscript{66}

While he did not support fully the entire Army "12 battery" plan as presented by Major Levan, McNamara did back the concept of maintaining open options by allocating funds for pre-production tooling and procurement of long lead time items in FY63. On November 24, in a second session with DOD and Army personnel, Kennedy verbally gave tentative approval for the provision of "about $100 million" for such pre-production in the new budget.\textsuperscript{67} On the basis of a general consensus among the non-Army advisors and officials present, the President also indicated that funding for the actual "12 battery" plan would not be included in the DOD budget. The line of argument supported by Wiesner, Brown, and Ruina had prevailed, and any initial support for actual deployment on the part of McNamara appeared to dissipate. The current NIKE-ZEUS, in any form of deployment, was not acceptable on technical grounds. The promise of future technological advances made the question of pre-production funding somewhat less objectionable, but Wiesner and others saw this as a somewhat wasted effort, given the kinds of changes anticipated in ABM systems design.

The President's action, while tentative in nature, was cause for some excitement on the Army's part. After five years of debate, a chief

\textsuperscript{66}Interview A, Interview B, Interview F. Lemnitzer, an Army general, and Taylor, former Army Chief of Staff (later to become JCS chairman) and ZEUS advocate since 1956, sought full deployment. Wiesner, concurring with PSAC evaluations, saw the system as technically unacceptable.

\textsuperscript{67}Interview A, Interview D. One of the few press accounts of the time which accurately distinguished between the Army recommendation and the actual presidential decision is Fred S. Hoffman, "Administration to Ask Funds for Nike-Zeus," \textit{Washington Star}, December 2, 1961.
executive had finally indicated a willingness to allow initiation of a production program for NIKE-ZEUS. Unfortunately for ABM supporters, the Hyannisport decision had been made in a context somewhat removed from detailed consideration of the budgetary ramifications of such a production plan. In mid-December, Bureau of the Budget personnel recommended that Kennedy reverse his November 24 ruling. Anxious to keep the FY63 DOD budget as close to $50 billion as possible, and openly antagonistic toward funding of a program which in their view would never be produced in quantity, the Budget Bureau convinced the President to drop the $100 million ZEUS pre-production fund. Once again, the Army would approach Congress without administration backing for anything beyond R&D authorizations for its ABM program.

THE FY63 CONGRESSIONAL HEARINGS: PREVIEW OF THE McNAMARA STRATEGY

Although the initial battle had been lost, the Army approached the 1962 defense authorization hearings with some optimism. Their NIKE-ZEUS test program was on schedule, Soviet ABM progress had given them an excellent means by which to widen the base of legislative support for their deployment plan, and the Secretary of Defense seemed to look upon the ZEUS program with much more favor than had any of his predecessors. Army budgetary tactics foresaw continuing emphasis on the need to get an operational ABM in place as soon as possible. The upcoming Pacific tests of ZEUS, scheduled for July, were viewed as ideal prompters for a summer

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Congressional insertion of production funding of the system.

The Army arguments, however, were met head on by the forceful presentation of Robert McNamara. In the most detailed exposition of its kind in history, the Secretary reviewed his department's position on the various roles and requirements of the major types of military forces. He emphasized that he had implemented President Kennedy's insistence upon a "requirements" criterion as opposed to a "ceiling" method for determining force structures. 69 McNamara went on to describe the now-famous technique of systems analysis which was employed to facilitate more specific comparisons of the costs and effectiveness of alternative weapons systems.

In presenting the budgetary requests for strategic offensive forces, he noted that this portion of the force structure had been chosen in 1961 for the initial systems analysis calculations. Because the measures of effectiveness and the models of weapons performance in this particular area were felt to be reasonably precise and well understood, the strategic offensive systems were analyzed in detail. Having explained this to the committee, the Secretary then turned to the strategic defensive weapons:

In contrast to the offensive mission, the defensive mission does not lend itself to even a reasonably close calculation of requirements. Further, we must bear in

mind that no matter how much we spend, we simply cannot in this day and age provide an absolute defense for the Continental United States.\footnote{Ibid., p. 3178. This was the first time that DOD had presented a budget item listing in terms of "program packages." This technique had important implications for defense policy decisions in the future, and the treatment of ABM systems under such a procedure will be analyzed in later chapters. For a description of program budgeting, its rationale, form, and implications, see citations noted in Chapter 1, footnote 10.}

With this observation as preface, McNamara began the debate on NIKE-ZEUS by citing a number of OSD objections to deployment of that weapon system. Even if a point defense system was deployed, the problem of nuclear fallout from enemy ground bursts outside the defended areas meant that casualties would remain high. Because current ABM concepts would not cope with this situation (this is the "upwind tactic" first put forth by WSEG in 1959) in the five-year time frame under consideration (1963-1967), DOD was seeking some $700 million for a civil defense program.\footnote{Ibid., pp. 3179, 3183, 3191. Civil defense, especially fallout shelter construction, had been and continued to be a program strongly favored by President Kennedy. Although the "Berlin Crisis" supplemental defense budget found the President's first shelter bill appropriated in its entirety ($207 million), such Congressional approval appeared to have been possible only because of the crisis atmosphere. The $700 million follow-on plan was expected to receive much greater--and traditionally expectable--legislative opposition.}

McNamara stated that the upcoming ZEUS tests at Kwajalein would benefit U.S. scientists working on offensive missile penetration, but said that even if ZEUS performed well, the administration would defer a deployment decision until the "advanced ZEUS" (i.e., SPRINT) was developed.\footnote{Ibid., p. 3583.}

The Army responded by indicating reasons why the Congress should not wait for the technology to which the Secretary referred. General Arthur Trudeau emphasized Soviet ABM progress and questioned the advisability of OSD's civilian personnel overriding the Army on matters of
military judgment. The Army R&D chief also called for resumption of U.S. atmospheric nuclear testing, an issue then under evaluation by the White House. Trudeau stressed the manner in which such tests could reduce many of the uncertainties which bothered ZEUS' opponents.\textsuperscript{73} Asked about specific pre-production funding levels, the general suggested an authorization of $190 million above and beyond the $267 million RDT&E expenditure requested by DOD.

The appropriations hearings found DOD and Army ABM arguments voiced in even greater detail than they had been in the Armed Services forum. In response to questions from the House DOD Appropriations Subcommittee, Secretary McNamara addressed directly the points of difference between himself and the Army. As for Soviet ABM work, McNamara noted that OSD had planned in accordance with the possibility of a Russian deployment, and that such a contingency required U.S. emphasis on offensive, not defensive weapons. He reiterated the view that the upcoming ZEUS tests, while beneficial to the Air Force and DDR&E work on penetration aids, would not influence his decision not to deploy NIKE-ZEUS.\textsuperscript{74}

Because of the current ZEUS system's serious performance handicaps, further R&D on the weapon should be justified only on grounds related to offensive force design research. The Secretary was explicit in distinguishing between fulfillment of the Army's current ZEUS development objectives and provision of an acceptably effective ballistic missile defense

\textsuperscript{73}Ibid., pp. 3584, 3595, 2596.

for the nation. Even if the Pacific tests were fully successful, OSD would not be justified in asking for NIKE-ZEUS production. In McNamara's own words, "I have tried to be very careful not to recommend anything for production that did not have a capability to add to our security.... That is why I feel we should not produce the ZEUS."\(^7^5\)

In response to this testimony, the Army again stressed the need to begin ABM production immediately. Chief of Staff George H. Decker based his position on the assumption that ZEUS deployment was inevitable, and argued that the immediate goal should be pre-production funding, so as to cut the lead time prior to the system's initial operational capability.\(^7^6\) General Trudeau answered the DDR&E skepticism regarding ABM performance by openly questioning the availability and effectiveness of the kinds of penetration aids described by DOD and Air Force scientists.\(^7^7\) The Air Force, joining DOD in criticism of the performance potential of ZEUS-type ABM technology, pushed for further support of its own exotic and expensive spaced-based ABM, Bambi.

The Senate appropriations hearings found the debate's protagonists delivering essentially identical statements to those presented to the House. Strong backing from key committee members did prompt the Army to provide some more pointed criticisms of DOD policy on the ABM issue, however, and General Trudeau voiced two specific arguments which would

\(^7^5\)Ibid., pp. 257-258.

\(^7^6\)Ibid., p. 348. The initial Army request had been $401 million, or $130 million beyond the basic DOD-approved figure. This additional money was designed for procurement of long lead time items.

\(^7^7\)Ibid., p. 349.
characterize that services' weapons acquisition philosophy in future years. The General accurately described the traditional U.S. procedure for acquiring advanced weapon systems as one in which, for most cases, production decisions had been taken prior to the time at which R&D had been completed. In simple terms, it was not standard procedure to require a weapon to prove itself fully in advanced development and testing before assembly line work could begin.

To delay production beyond the proper point was to waste funds in the form of later and unnecessary R&D. Trudeau argued that a deployment go-ahead on ZEUS should have "naturally" followed the 1961 White Sands tests, and that OSD's delaying of such a decision was improper. The second argument presented by the General was one form of a strategic hypothesis which was to play a key role in future years of the ABM debate. In general terms, the position assumes that the Soviet Union, aware of East-West strategic forces relationships, must react to an American ABM deployment. Trudeau argued that such a reaction would benefit the United States immensely, in that the Russians were at an economic disadvantage vis-a-vis America's greater resource availability. ABM deployment would force the enemy into a weapons race he could ill-afford, because the Soviet response would cost them "three times as much effort as it would be costing us of our resources."


79 Ibid. (Hearings), p. 1088.
The opposite side of the reaction argument, the view that Soviet response could and would be undertaken without economic disaster, came to a quite different conclusion. This position, which was not really present in the ABM debate until 1964, saw a reasonable Russian response, in either offensive or defensive forces, as simply reestablishing whatever strategic "balance" existed prior to the two moves, with the net result being a loss to both sides, a loss equal to the resources committed. In the early 1960's, the "economic advantage" type of response argument was the prevalent version, and the arms race was viewed as a necessary or inevitable consequence of the times. It was not until the tensions of the cold war had subsided somewhat, not until the crisis atmosphere which surrounding the days of SPUTNIK, Berlin, and Cuba had calmed, that the negative "reaction" view, the anti-arms race argument, became an important part of defense policy debates.

PREFLUD MO NTROVERS Y: THE EMERGENCE OF NEW UNCERTAINTIES

The administration's position on NIKE-ZEUS in the early months of 1962 was both a shock and a threat to the Army and other ABM supporters. Not only were the President and his Defense Secretary opposing FY63 production of ZEUS, but they were indicating that the program should be relegated to an R&D-only status, to be used solely as a test vehicle to provide ABM and penaid data useful in more advanced weapons programs. ZEUS had been in serious difficulties before, but this situation represented a threat to its very existence. It was not that the Army opposed the ABM advancements sought by DOD, it was simply that the service wanted to deploy ZEUS before moving on to the new program.
Army efforts to secure stronger Congressional backing had been unsuccessful in January and February; even Congressman Carl Vinson's House Armed Services Committee, strong ABM supporters in past years, had accepted McNamara's views on deployment of ZEUS. As for legislative attention to the question of ABM systems, the Army had again taken a back seat to the Air Force. It was the latter service's favorite new weapon system, the B-70 bomber, which commanded much of the attention of defense policy-oriented Congressmen. In the next eighteen months, however, a complex series of events would insure that the Army's ABM arguments attained high saliency within the government. Already emerging in the Spring of 1962 was the question of U.S. nuclear testing policy, an issue which entailed multiple uncertainties of both a technical and strategic nature.

The political atmosphere in which the nuclear testing and test ban issues would be debated was further complicated by the status of ABM technology itself. The Pacific test program and the promise of greater system performance through utilization of phased array radars and the high acceleration SPRINT insured that the ABM question would be a key issue in the test ban debate. The scientific community's doubts concerning nuclear weapons effects and the extent of U.S. knowledge of those effects emerged in full view of a Congress fearful of the strategic consequences of both a test ban and continued arms races. The result was a political debate whose concern with technical and strategic questions made it one of the most complex foreign policy issues of the post-war era. Before this could take place, however, the technological aspects of the ABM issue were to undergo additional changes.

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PART II
THE ABM DEBATE
STRATEGIC DEFENSE AND NATIONAL SECURITY

by
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CHAPTER V

ABM ACHIEVES A NEW PROMINENCE: THE BIRTH OF NIKE-X

RESUMED NUCLEAR TESTING: THE QUEST FOR NEW ABM INFORMATION

The two most significant issues influencing the ABM debate in mid-1962 were the Pacific Range NIKE-ZEUS tests and the possibility of resumed nuclear testing in the atmosphere on the part of the United States. ABM supporters viewed the expected success of the live Kwajalein tests of ZEUS versus Air Force ICBMs as a potentially powerful justification for rapid deployment of the Army's defensive system. NIKE-ZEUS had in the past suffered at the hands of critics who doubted the weapon's performance capability, and a few successful intercepts in the tests could assist the Army in countering such objections. Although the Army in 1959 had publicly dismissed the idea that nuclear weapons effects in the battle environment could hinder ABM performance, many scientists looked to renewed U.S. atmospheric testing as an opportunity to examine further the questions raised in the 1958 high altitude tests.

The Atomic Energy Commission had resumed its underground nuclear testing program in September, 1961, following the Berlin crisis-inspired test moratoria revocations by both Russia and the United States. U.S. atmospheric tests had been delayed pending the outcomes of the Geneva talks, where the participating nuclear powers hoped to arrive at a mutually acceptable inspection system for a test ban. While President Kennedy had a deep commitment to securing a test ban, recent events fostered growing pressure on
his administration to resume testing. Central to this pressure was the fear that Soviet nuclear research, beginning with their live ABM test in September, 1961, had given that country a large advantage in strategic weapons technology. The Army, using Soviet ABM progress as an argument for NIKE-ZEUS deployment, quickly sided with those seeking a test resumption.  

While it is generally true that supporters of NIKE-ZEUS favored atmospheric tests, the reverse did not necessarily hold. In the four years since the U.S. nuclear tests in 1958, many defense scientists who doubted ZEUS' utility had grown increasingly curious regarding the unanswered questions generated by the HARDTACK and ARGUS programs. What was the ABM potential of large (megaton range) nuclear weapons? What were the effectiveness, the potential kill radii, associated with various nuclear destruction mechanisms such as blast, neutron flux, and thermal X-rays? Finally, could a complex ABM system's radars and electronic components continue to operate in the hostile environment created by the detonations of many offensive and defensive nuclear weapons?  

A debate on the testing resumption issue evolved within the government, and two strategic objectives of the Kennedy Administration came into conflict. The desire to maintain a favorable strategic nuclear posture

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1The Soviet test series in 1961 lasted from early September through November, and included some 50 individual tests, a number of which were ABM-related. Jacobson and Stein, pp. 341-342. These authors' case study of the test ban issue provides an extensive and unparalleled examination of the political, strategic, and technical issue associated with the complex question of nuclear testing and arms control in the early 1960's.

vis-à-vis the Soviet Union led to the view that renewed U.S. testing was necessary in order to offset Russian gains in their recent atmospheric test series. The Joint Chiefs of Staff, backed by members of the powerful Joint Committee on Atomic Energy, urged the President to begin testing in the atmosphere. Secretary McNamara supported the Chiefs, noting U.S. uncertainties regarding weapons effects and warhead design.⁴

President Kennedy had a second strategic objective which was central to the testing issue, an objective in partial conflict with the first. It was the administration's feeling that a nuclear test ban would have beneficial effects on slowing the arms race. Further, any realistic hope for eventual arms limitations appeared to require such a ban as a prerequisite to later negotiations. A number of the President's advisors were concerned that a U.S. testing resumption would so damage the ongoing Geneva talks with the Soviets as to place in jeopardy the chance for agreement on a test ban. The Special Assistant for Science and Technology, Jerome B. Wiesner, United Nations Ambassador Adlai Stevenson, and numerous State Department officials advised Kennedy not to resume. Even Secretary McNamara let it be known that he was dubious as to the need for immediate tests.⁴

The uncertainties involved in this testing decision were similar to, yet subtly different from, the test ban issue. In supporting the test ban, the administration could argue that the long-range strategic benefits, in

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³ Jacobson and Stein, p. 345. Weight-to-yield ratios, and multimegaton technology were other areas of research mentioned by the services and the JCAE.

⁴ Ibid.
the form of a lessened arms race and dampened nuclear proliferation, overcame the strategic uncertainties attendant to halting a major aspect of research and development for nuclear weaponry. The immediate issue of resumed testing, however, involved a slightly different calculus. Both sides of this latter question would consider the long-range goal of the ban as desirable yet still disagree on a resumed atmospheric program. Wiesner and others were arguing that the technological loss associated with abstention from renewed testing, while real, was balanced by the possibility that success at the negotiating table in Geneva depended upon such abstention. For these men, the status of the test ban deliberations was such that the U.S. should think twice before taking an action which could upset those talks.

The Joint Chiefs and their supporters took a position which assessed the technical import of additional atmospheric tests quite differently. A future nuclear test ban would be acceptable to the United States only if that treaty froze weapons technology knowledge in a manner which did not represent a serious strategic disadvantage to the U.S. The recent Soviet test series, representing as it did a major step in such knowledge, left the Russians with a significant lead, in the opinion of the Chiefs. A renewed U.S. test program was therefore viewed as a mandatory step to upgrade lagging weapons effects and design technology, a step prerequisite to negotiating a test ban.

President Kennedy heard both sides of the issue in detail and accepted the idea that future military security would suffer from serious uncertainties unless a minimum number of new atmospheric tests were conducted. On March 2, 1962, he announced that, unless the Soviets agreed to a foolproof
test ban, the United States would resume atmospheric testing. Kennedy indicated that he did not believe the Soviets possessed a "developed" ABM system, but he did stress that a principal purpose of the U.S. tests would be to provide DOD with high altitude weapons effects data equivalent to that gained by Russia in their own program. Central to the President's assessment were the familiar problems of communications and radar blackout and electromagnetic pulse (EMP) damage: "We cannot be certain how much of (our defensive) preparation will turn out to be useless--blacked out, paralyzed or destroyed by the complex effects of a nuclear explosion."

The political debate which had preceded the administration's decision provided a preview of the kinds of arguments which would characterize the nuclear test ban issue in 1963. The stand taken by one particular segment of the scientific community at this time is of particular importance to this case study. The majority of American scientists familiar with the ABM issue had generally opposed NIKE-ZEUS on wholly technical grounds. The nuclear testing issue combined with the strategic perceptions of certain of these scientists to produce still another anti-ABM rationale. A group of scientists centered in the Federation of American Scientists (FAS) and led in public by physicist Hans Bethe brought a new argument to the ABM debate.

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The Ad Hoc Zeus Committee's position that an "ABM race" would be to the United States' advantage for economic reasons was discussed in Chapter Four. The argument of Dr. Bethe and his supporters provides the antithesis to that belief. The scientists agreed with the administration that a highly effective ABM was an impossibility.\textsuperscript{7} Further, the FAS and others were concerned that the somewhat stable albeit delicate strategic weapons balance which currently existed would be seriously upset by an ABM deployment on either side. Such a deployment was seen as a threat, not a contributor, to national security. Central to the scientists' opposition to resumed testing was their assessment of ABM's technical status. If, as the President indicated, the primary objective was to improve ABM performance, it was argued that research in radar and computing systems would yield much more improvement than would nuclear testing.\textsuperscript{8}

The Geneva talks continued to drag through March and early April, prompting the administration to authorize the first of the new atmospheric tests. The series lasted from April 26th through mid-November, and included a total of 36 shots.\textsuperscript{9} Although public knowledge of the series was

\textsuperscript{7}Both Kennedy and McNamara were on record as believing that successful ABM development, i.e., a system with high effectiveness versus sophisticated ICBM, was probably impossible. See "Biggest Arms Race - The One Russia May Be Winning," \textit{U.S. News and World Report}, September 25, 1961, p. 48; and "No Missile Defense Seen," \textit{Baltimore Sun}, March 12, 1962.


\textsuperscript{9}\textit{Nuclear Test Ban Treaty, Hearings Before the Committee on Foreign Relations, U.S. Senate, 88th Cong., 1st Sess., August, 1963}, p. 522. (Hereafter cited as \textit{Foreign Relations Test Ban Hearings.})
limited, some technical information was available on the program. In particular, it was well-known that the series stressed ABM-related phenomena. ZEUS warhead tests, blackout assessments, high-altitude kill mechanisms, and other nuclear environment questions were central to the program. Additionally, the Atomic Energy Commission released a revised version of its original (1957) "Effects of Nuclear Weapons" handbook. Included in the new edition were detailed discussions of high-altitude weapons effects upon radar and communications. This data, derived from the ARGUS and HARDTACK series in 1958, thus became available to the public at a time when the relationship between nuclear weapons effects and missile defense systems performance was again becoming a central issue in the ABM debate.

Because of the time required to structure and evaluate the data gathered, the full impact of the 1962 tests would not be evident for many months. It was not until the administration and the Congress began to assess the implications of the partial test ban treaty the following year that many of the test results would become known to persons outside the DOD-AEC technical community. However, some aspects of the test series, especially in the high-altitude realm, were leaked in 1962. While these factors appeared to have little impact on the ABM issue itself in the following two years, they were to be crucial at a later date.

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In addition to ABM warhead tests at lower altitudes (tests designed to measure kill mechanisms and their effective radii), the AEC conducted five high altitude shots of varying sizes. Many AEC and DOD officials believed that Russian claims to an effective ABM capability in late 1961 grew out of the Soviet's own high altitude tests of that year. Accordingly, American scientists wished to examine the missile-killing potential of explosions at extreme altitude, in addition to studying blackout and EMP effects. Initial interpretations of these exoatmospheric blasts appeared to support the idea that ABM intercept at such heights allowed a great increase in kill radii.

Like the 1958 test series, the 1962 shots both answered questions and raised doubts. The ABM feasibility issue was again confronted with mixed results. Tests of NIKE-ZEUS warheads confirmed the design of that particular small-yield device. Data were gathered which provided precise information on certain aspects of the communications and radar blackout problems. In these two areas, uncertainties were lessened. However, other specific

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12 For a listing of these tests, see the AEC Handbook, 1964 edition, p. 677.

13 Further evaluation of these data, plus design of warheads which maximized such weapons effects, contributed to the breakthrough in ABM technology allowing true "area" defense. The use of exoatmospheric detonations to kill RVs with thermal X-rays was the key to the revised NIKE-ZEUS/NIKE-X system, called SENTINEL. The effectiveness of such a mechanism was not appreciated in 1962, however, and received little attention. For one of the rare public references to the subject at this early date, see "The H-Bomb Vs. Missiles," Business Week, July 14, 1962, pp. 106-108.

14 The public record is notably lacking in specific information on the 1962 tests. However, there are some illuminating discussions of the program continued in the records of the three test ban-related Congressional hearings which were conducted in 1963. In addition to the Senate Foreign Relations Committee and Senate Preparedness Subcommittee investigations
weapons effects tests heightened concern about the EMP and "self-blackout" problems, making these issues much more salient than they had been previously. Increased knowledge derived from the individual tests indicated that potentially serious problems could conceivably arise in the nuclear attack environment, problems resulting from the uncertain effects of many nuclear blasts occurring in proximate time and space.

Issues of comparative U.S.-Soviet weapons effects knowledge, desirability of more atmospheric ABM tests, and uncertainties regarding total defensive system performance would highlight the ABM debate in the 1963-64 period. The U.S. atmospheric tests in 1962 were important indicators of both the potentials and the problems of ballistic missile defense. The major uncertainties associated with blackout, EMP, and high-altitude kill mechanisms would arise again and again in discussions of the feasibility of ABM systems, and technical arguments were forced to rely on the data gathered in 1962. Subsequent underground tests provided new information in many areas, but certainty of knowledge of atmospheric weapons effects was still dependent upon the tests actually conducted in that environment.

Concerning the ban itself, the JCAE held detailed technical hearings on the subject of potential policing capabilities to prevent test ban violations. These JCAE hearings, titled "Developments In Technical Capabilities for Detecting and Identifying Nuclear Weapons Tests" (88th Cong., 1st Sess., March, 1963), include a lengthy explanation of the goals, problems, and some of the results of the 1962 tests. See especially pp. 352-84.
NIKE-ZEUS AND THE PACIFIC RANGE TESTS: SUCCESS FOR ABM

The relationship between the ABM deployment issue and the atmospheric testing question in 1962 had been of a general and long-range nature. The protagonists in the NIKE-ZEUS production argument had not tied the testing issue directly to the question of whether or not the Army should be allowed to produce its ABM system in FY64. The series of ZEUS-versus-ICBM tests on the Pacific Missile Range, however, had been directly connected by the Army to the NIKE-ZEUS deployment issue. That service was arguing that the Kwajalein tests were the last possible DOD roadblock to deployment, and that successful intercepts meant that McNamara could not delay missile defense procurement any longer.

The Defense Department realized that the Pacific tests represented a potentially powerful political tool for the Army should the ZEUS intercepts succeed as expected. DOD thus sought to prevent ABM advocates from over-dramatizing the test program. Strict guidelines were established regarding the form and content of press releases on the tests. Such statements were to be confined to only the most general references to the nature and success of the offense-defense engagements.\(^{15}\) Secretary McNamara continued to emphasize that the most serious questions regarding the NIKE-ZEUS system's capabilities could not be investigated, much less resolved, through the Kwajalein program. The key to the

\(^{15}\) These guidelines are discussed in "Department of Defense Restricts Nike-Zeus Testing Information," Aviation Week and Space Technology, Vol. 76, February 5, 1962, pp. 32-33.
Secretary's point lay in the difference between the planned tests' "one-on-one" series of shots and the more likely nuclear attack environment characterized by multiple ICBMs, decoys, and nuclear detonations. 16

By July of 1962, the Kwajalein NIKE-ZEUS facility was ready for the long-awaited tests. The third stage of the ZEUS had finally been checked out for full flight, the ZAR and computation gear on the Pacific island had been pre-tested against telemetry tapes of previous ICBM launches, and the Pt. Mugu aerodynamic flights of the ZEUS indicated that the interceptor's intricate guidance system was operating properly. 17

The political prominence of the ABM issue received an unexpected boost at this time when Soviet Premier Khrushchev boasted of his nation's missile defense capability. In an interview with visiting American news-


papermen in Moscow, Khrushchev reacted to recent U.S. claims of overwhelming superiority in strategic weaponry by asserting that Russian ABM systems could "hit a fly in outer space."  

On July 20, the Defense Department released information that a NIKE-ZEUS had for the first time successfully intercepted an ICBM on the Pacific Range. The announcement, coming as it did only a few days after Khrushchev's boast, was well-received by the Congress. It was also brought to light that an earlier interception test in recent days had been unsuccessful, reportedly due to failure of the ZEUS third stage to ignite. The Army could at last cite concrete proof of its ABM system's capabilities, and future tests held the promise of even more successful intercepts.

The Defense Department continued to doubt the ultimate utility of the NIKE-ZEUS, even in light of the test success. McNamara himself emphasized the strength of the U.S. offensive forces, even against an enemy ABM, and noted that ZEUS was not an effective defense system. DOD continued to emphasize that the tests were by no means accurate.

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20 Ibid. See also George Carroll, "Zeus Bullseye Answers K's (sic) Anti-Missile Boasts," New York Journal American, July 20, 1962. An interesting speculation which arises in light of the timing of the DOD announcement is that Khrushchev may have known of the first Kwajalein shot (the failure), and that the Soviet Premier made his "hit a fly" remark specifically to counter anticipated successes in the Kwajalein tests. While there is no way to substantiate this, the dates make such a sequence of events conceivable.

simulations of the operational ABM environment, and that it was the element of that environment missing from the tests--blackout, decoys, and multiple attack--that negated NIKE-ZEUS' ultimate effectiveness. The July 19 test's realism was put in further doubt by reports that the ICBM launched from Vandenberg Air Force Base had actually carried a transmitter to clue and guide the ZEUS to its target.\textsuperscript{22}

\textbf{ABM IN TRANSITION: OUT OF NIKE-ZEUS, NIKE-X}

Many more NIKE-ZEUS intercepts were scheduled for 1962 and 1963, but none would come before the administration began to formulate its FY1964 budget. As the Army prepared its ABM program request for that budget, it appeared that Secretary McNamara's January prediction that the Pacific Range tests would not be important in upcoming deployment decisions would prove true.\textsuperscript{23} Instead, the promise of great ABM performance gains through development of new radars and high-acceleration interceptors overshadowed the Kwajalein results. The deployment issue had thus acquired a different form: Should DOD support an intermediate deployment of the basic ZEUS system, to be supplemented later by SPRINT and phased array radars, or should the older components simply be shelved or relegated to research programs.

The manner in which the competing desires and differing perceptions of various organizations and individuals involved in the issue interacted

\textsuperscript{22} \textit{Ibid.}, (Time).

\textsuperscript{23} See McNamara's testimony in \textit{House Defense Appropriations Hearings} for 1963, p. 25.
in the fall of 1962 makes that particular portion of the debate an interesting example of the defense policy process. Differential assessments of the nature of strategic forces at future dates were of particular importance. Documentation of these differences is useful in illustrating the manner in which differences on matters of strategy and technology can influence the character of a political debate. This particular aspect of the ABM debate also indicates the degree to which arguments made by government organizations can differ significantly depending upon whether they are for public consumption or for internal policy debate.

In mid-August, the Army proposed to OSD that the FY64 budget include a deployment of NIKE-ZEUS batteries to provide an "intermediate" missile defense system. These initial batteries would later be upgraded by the addition of the new radars and interceptors currently under development.24 Such a program offered some operational defense capability at a date (1967-68) approximately two years earlier than would be the case if DOD waited for the new hardware to be developed. The Army's publicity of ZEUS continued to stress the Kwajalein success, the urgent need for defense, and the seriousness of Soviet ABM work.25 In the DOD debate, however, the supporters of NIKE-ZEUS were making a different type of argument.

24 Payne Speech, p. 10

The most telling criticism of the current ZEUS was that it would be critically vulnerable to enemy penetration aids. The Army's system was viewed by ABM opponents as inadequate if and when an appreciable percentage of ICBM payload was devoted to such penaids, and even lesser amounts of decoys were credited with relegating ZEUS performance to the "marginal" category.\(^{26}\) While the Army did not seriously challenge this assessment, ABM proponents did question the validity of the enemy force structure assumptions made by OSD and DDR&E. Specifically, the Army argued that Soviet offensive forces deployed in the same time frame as the current ZEUS plan might not be sophisticated enough to overwhelm the early ABM system. It was noted that current ICBMs were utilizing only tankage decoys and chaff, and the Army argued that the ZEUS radars were not seriously hindered by such penaids.\(^{27}\)

The issue was predicated on an argument as to the reasons why the ICBM forces of the day lacked sophisticated penaids. The Army's basic claim was that NIKE-ZEUS would be effective for at least a few years until the Soviets developed more sophisticated decoys, i.e., until they attained a capability to deceive the potentially vulnerable ZEUS. Civilian planners in DOD, on the other hand, were arguing that the absence of sophisticated decoys in both the U.S. and Soviet ICBM forces was a matter of intention, not capability. These men saw such an absence as logical in a situation where neither side possessed a serious ABM capability. Although both nations could arm their RVs with

\(^{26}\)Supra., p. 146.

\(^{27}\)Interview J, Interview A.
sophisticated decoys, such a move represented a waste of valuable ICBM payload in the absence of an enemy ABM. The DOD argument was simply that the Soviets could and would negate a ZEUS deployment with advanced penaids, and could accomplish this in time to meet such a U.S. capa-

bility, given the lead times involved. DDR&E director Harold Brown provided a concise statement of this position in testimony before the Senate Preparedness Subcommittee:

The United States decided not to deploy the NIKE-ZEUS because its effectiveness was inadequate against U.S. penetration aids programmed for entry into the U.S. in-

ventory before a NIKE-ZEUS system could be deployed, and we assume the same would be true of Soviet penetration aid capability.28

These differences between Army and DOD would not be resolved through the kind of technical evaluations which had characterized administration settlement of the ZEUS deployment issue in previous budget cycles. The issue was one related to intelligence information on Soviet technology, a question which was subject to considerable uncertainty. Further, the matter involved one of the most sensitive of all types of force struc-
ture information, the nature and extent of penetration aids used on op-

erational ICBMs. It was not surprising, then, that the deployment de-
bate, even within the administration, focused more upon the differential utilities of ZEUS versus the more advanced ABM utilizing SPRINT and phased array radars. By illustrating NIKE-ZEUS' inadequacies when com-

pared to the planned new system, defense officials could shift the con-
text of the issue from a debate about penetration aids to a discussion of promising new capabilities in the ABM field.

28Quoted in Payne Speech, p. 11 (emphasis mine). See also the test-
imony of Secretary McNamara in the Military Posture Hearings (Senate), 1963, p. 150.
The implications of the new SPRINT/phased array concept went far beyond technological factors. The defense community had already begun to examine the strategic ramifications of the shorter-range, high-acceleration SPRINT. As early as 1960, the Air Force, concerned with defending ICBM sites, had conducted a "hardpoint" missile defense study called HARK. Because the point defense aspects of ABM systems were part of the Army's mission, DOD ordered the Air Force to terminate this program in 1961. Two parallel studies, one by ARPA (entitled "Hardpoint") and one by the Army Ordnance Missile Command (called "Hardsite"), were then initiated. Both efforts emphasized the capabilities and potentials of terminal ABM systems characterized by short range, ability to utilize atmospheric RV discrimination, and semi-hardened ground components.

DDR&E Director Harold Brown sought the advice of his staff on the Army plan, and from the deliberations within that particular group of technical experts evolved what would later become administration ABM policy. During the summer months, Brown had polled DDR&E and ARPA scientists on the desirability of a NIKE-ZEUS deployment in light of planned improvements in ABM system components. The general consensus was that the ZEUS system which the Army was recommending continued to be unacceptable, and that the promise of new technology was all the more reason to shelve the ZEUS permanently. Brown concurred with this


30 Ibid. The Army's AOMC had mission responsibility for ABM systems.

31 Interview B.
view and asked ARPA director J. P. Ruina to formulate specifically the DDR&E/ARPA position on ABM technology. It was the opinion of the civilian defense scientists that the ABM development emphasis should be shifted from the obsolescent ZEUS to the promising SPRINT and phased array radars.  

In mid-September, Ruina briefed the President's Science Advisory Committee on the DDR&E position. In the process, the ARPA director coined the name which came to represent America's second-generation ABM system. He described a system which he called NIKE-X, a system which included the following components: the SPRINT high-acceleration interceptor, phased array radars, improved computers, and hardened ground components. The NIKE-ZEUS system, even with radar improvements, was deemed a poor investment, specifically because the low speed of the ZEUS interceptor made it fatally vulnerable to decoys. It was recommended that the R&D resources previously utilized in the ZEUS program be shifted to work on NIKE-X.

In October, PSAC issued a report in support of the DDR&E position. This recommendation was forwarded to Secretary McNamara in early November. Dr. Brown formally submitted the Ruina analysis to McNamara.

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32 Ibid. See also Fink Speech, pp. 4-5; and Fink, "Strategic Warfare," p. 59.

33 Interview K. Bell Laboratories had initially dubbed the new system "NIKE-PHONIX," but it was Ruina's "NIKE-X" which stuck. DDR&E envisioned using the ZEUS "discrimination radar" as a target track radar. The ZEUS interceptor itself was deemphasized, but the Army kept that system as a test vehicle. That service also would continue to recommend that NIKE-X deployments incorporate a certain number of the older, long-range interceptor.

34 Payne Speech, p. 11.
at this time also. A memo on the subject, written by Ruina, was forwarded through Brown and McNamara to President Kennedy. The President was therefore the recipient of a unanimous recommendation from his civilian technical advisors: ARPA, DDR&E, PSAC, and McNamara himself sought full development of NIKE-X and rejection of NIKE-ZEUS deployment. Kennedy accepted his advisors' recommendations, announcing in a December 17 television speech that he would not deploy NIKE-ZEUS. In January, the President directed the Army to drop its plans for ZEUS production and concentrate on the NIKE-X technology "at highest priority."  

From the Army's perspective, the administration's actions were indeed bittersweet. That service had been ordered to terminate its production plans for NIKE-ZEUS, thus precluding the chance that the U.S. would deploy an ABM in the next two to three years. Instead, the President was ordering a shift to a new system, a system whose components had to be developed before any deployment could be expected. The DOD arguments against ZEUS had always been there, but until now they had not succeeded in removing the possibility of that system's eventual production. It appeared that the President's order dictated just such a circumstance.  

However, ABM advocates were not faced with a situation which was entirely disadvantageous to their position. The DOD civilian scientists, long-time opponents of NIKE-ZEUS on technical grounds, had indicated

35Ibid. Interview B, Interview D.  
36See Jim Lucas, "Nike-Zeus Plans Appear Dashed," Washington News, December 19, 1962; and Fink Speech, p. 5. The Army had already contracted with Martin-Marietta to develop the hardware for the SPRINT, and work had begun in October.
significant optimism as to the performance potential of the proposed NIKE-X system. While ZEUS appeared to be a hopeless cause, it was possible that the Army might benefit in future ABM deployment recommendations by the support of the same technical analysts who had so vigorously opposed them in earlier years. The Army had not yet conceded the issue, however, the President Kennedy and the Congress had not heard the last of the pleas for NIKE-ZEUS deployment. New information of both technical and strategic importance added to the prominence of the Army's effort.

THE FY64 BUDGET: EMPHASIS ON NIKE-X

The subject of comparative U.S.-Soviet capabilities in strategic weaponry and nuclear technology represented the predominant American defense policy issue of 1963. While the nuclear test ban issue itself was the central point of debate, the ABM issue enjoyed a high degree of attention in its own right. As a prelude to the administration's presentation of the FY64 budget to the Congress, the Army gained support from two sources in its drive to secure a production commitment for NIKE-ZEUS. As the administration debated its new budget in November and December of 1962, the Army conducted four more anti-ICBM tests on

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37 For a description of the context of this optimism, see James Trainor, "DOD Says AICBM is feasible," Missiles & Rockets, Vol. 11, December 24, 1962, pp. 14-15. While Trainor emphasizes both the NIKE-X "hardpoint" defense of U.S. Minuteman ICBMs and an "urban defense" utilizing the old ZEUS, the latter concept appears to have been much more a function of Army hopes than of DOD thinking. Most of the Defense Department ideas at that time looked to the new NIKE-X as being much more acceptable, even in the population defense role, than was the ZEUS. See Fink Speech, pp. 5-6.
the Pacific Range. Although two of the tests were failures, the majority of the public media coverage was favorable, stressing the successful intercepts.  

ZEUS' backers received an expected, but not insignificant, endorsement for their deployment plan from the Joint Chiefs of Staff. The JCS were one vote short of unanimous support of the intermediate ZEUS system. Air Force Chief Curtis LeMay, the only anti-ABM vote in the previous year's JCS tally, again opposed the Army plan. There were some indications, however, that the Air Force was more receptive to ABM deployment at this point than it had previously been. The fact that the leading ZEUS advocate on the JCS, Chairman General Maxwell Taylor, had in the same session opposed the Air Force's SKYBOLT missile may have prompted LeMay's vote against the Army plan. If this was indeed the case, it would not be the first (nor the last) time that the Chiefs withheld support of other services' programs pending corresponding assistance for their own service.

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38 See "Two Nike-Zeus Tests Reported to Have Failed," Washington Star, November 15, 1962; Philip Dodd, "Missile Killer Nike-Zeus Scores Second Success," Chicago Tribune, December 13, 1962. In the December 12 test, two interceptors were fired at the RV, and one of the ZEUS rockets failed. The final 1962 test was on December 23, and again, one of two ZEUS launched against the RV failed, while the other conducted a successful intercept. See Earl Ubell and Stuart H. Loory, "The Death of Nike-Zeus," Saturday Evening Post, June 1, 1963, p. 16.


40 Ibid. Only Taylor sided with Secretary McNamara in opposing SKYBOLT. Lemnitzer (USA) and Anderson (USN) both supported LeMay. The Chiefs all emphasized the value of ABM systems in their Congressional testimony. See House DOD Appropriations Hearings for 1963 (Part II), especially pp. 31, 131, 134, and 586 (LeMay limits his ABM support to the R&D phase).
The administration apparently appreciated the potential debate which could arise in the Congress over the NIKE-ZEUS deployment issue. A growing awareness of recent improvements in Soviet strategic weaponry capabilities, both offensive and defensive, provided powerful ammunition for ABM proponents. In addition, the Kwajalein tests removed one of DOD's previous arguments for delaying ZEUS deployment. In his annual "Posture Statement" prepared for delivery to the Armed Services Committees, Secretary McNamara explained in some detail the various technological considerations and deployment options which were examined in the course of the final DOD decision on FY64 ABM policy recommendations.

As for the NIKE-ZEUS itself, the Secretary noted that increased knowledge of ABM phenomena gained in 1962 had led to general DOD agreement that the current ZEUS system "would not be effective against a sophisticated threat in the late 1960's and early 1970's." Repeating the essential points of the DDR&E review of the past summer, McNamara cited four possible improvements in the ZEUS system, including use of the discrimination radar as a high-volume target tracker, modification of the ZEUS missile to reduce the minimum intercept altitude, development of SPRINT, and development of phased array radars. From this evaluation came three major alternatives for the FY64 program:

a. The first alternative envisioned the continued development and testing of the present NIKE-ZEUS system and a separate limited development of the new advanced radar.

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b. The second alternative called for proceeding with all four major improvements with initial deployment of a system incorporating initially only the first two improvements.

c. The third alternative envisioned skipping the first two improvements and proceeding on an urgent basis with the development of the more advanced system (NIKE-X), incorporating the SPRINT missile and advanced radars, and deferring the decision to deploy the system.\textsuperscript{42}

The alternative chosen by DOD was, as we have already seen, the third one, calling for full emphasis on the new NIKE-X. In rejecting the NIKE-ZEUS deployments called for under the other two plans, McNamara conceded that there were marginal benefits to be gained by possession of such a ZEUS system. Under conditions of a "small" or "medium" Soviet attack, even the ZEUS could reduce casualties somewhat. Further, the deployment would complicate Soviet offensive force design and tactics. However, the Secretary deemed the disadvantages of the Army's recommended plan to be stronger than these gains. In particular, U.S. knowledge of both reentry phenomena (decoy behavior, radar capabilities, etc.) and nuclear weapons effects (especially the "self-blackout" problem) was somewhat lacking. Under these circumstances, DOD chose to emphasize further R&D to reduce the uncertainties attendant to these two areas of technology.\textsuperscript{43}

\textsuperscript{42}Ibid., pp. 47-48.

\textsuperscript{43}Ibid., p. 48. The Secretary's emphasis on U.S. lack of knowledge in atmospheric weapons effects would prove somewhat embarrassing in later months when, in supporting the administration's advocacy of the partial test ban, McNamara would claim that such knowledge was not a major problem in ABM design.
The resource commitment to ABM development, even without any commitment to actual deployment, continued to be substantial. The ZEUS program itself had consumed $1.47 billion through FY63, and the advanced ABM work done by ARPA (GLIPAR, PRESS, DEFENDER, etc.) had accounted for another $500 million in the same period. 44 The administration was now requesting $335 million for the Army's ABM program, plus another $128 million for ARPA's DEFENDER. Within the ABM program, $246 million would be applied to the new NIKE-X, while $89 million was provided for continued development and testing of NIKE-ZEUS. 45

Secretary McNamara concluded his analysis of U.S. ABM programs by inserting a new argument into the deployment position of the current administration. The Secretary insisted that resources must be committed for another facet of population defense prior to any production funding of ABM systems:

The effectiveness of an active ballistic missile defense system in saving lives depends in large part upon the existence of an adequate civil defense system. Indeed, in the absence of adequate fallout shelters, an active defense (ABM) might not significantly increase the proportion of the population surviving an all-out nuclear attack. For this reason, the very austere civil defense program recommended by the President...should be given priority over any major additions to the active defenses. 46

President Kennedy had long been committed to upgrading the civil defense facilities of the nation. Although his first fallout shelter program was approved intact by the Congress in the crisis atmosphere of August,


46 1963 Posture Statement, p. 49.
1961, subsequent civil defense requests fared poorly. The administration's FY63 shelter program, which initially requested $695 million, was rejected almost totally by the House Appropriations Committee. When that budget finally emerged from Congress, only $10 million remained in the civil defense package.47

For McNamara, the shelter argument represented a useful tool for controlling ABM funding according to administration desires. Detailed analysis of potential nuclear attack scenarios provided the basis for the "buy shelters first" position. If the criterion under consideration was reduction of civilian fatalities, then fallout shelters provided much greater return for a given level of initial investment than did an ABM system.48 The Secretary of Defense was using the Army's own argument, the position that called for expenditures to reduce fatalities under nuclear attack conditions, to insert the civil defense issue into the ABM debate. His statement to the House DOD Appropriations Subcommittee indicated a new hurdle for the Army and its supporters: "I personally will never recommend an anti-ICBM program unless a fallout program does accompany it. I believe that even if we do not have an anti-ICBM program, we nonetheless should proceed with the fallout shelter program."49

The shelter argument provided the administration with an excellent lever in the ABM debate. The Congress was being told that if they wanted active population defense, they first had to overcome their objections

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49 Ibid., p. 439.
to civil defense. Active defense systems, especially point defense systems like NIKE-ZEUS and NIKE-X, were vulnerable to the "upwind" tactic, the option of the attacker to detonate weapons outside the defended sectors and inflict casualties through fallout. An ABM system without an accompanying fallout shelter system was thus an ineffective defensive shield. Further, if a nation had neither shelters nor an ABM, cost-benefit analysis indicated that the first step in securing defenses should be shelter construction. While an ABM was ineffective in lieu of civil defense, a shelter system could save many lives even without the active defense system. 50

CONGRESS AND SOVIET ABM PROGRESS: A NEW SECURITY "GAP"?

Although Secretary McNamara and his aides had been quite emphatic in opposing any deployment of the NIKE-ZEUS, the Army and its supporters had not conceded the issue before the Congress. JCS Chairman Maxwell Taylor and Army Chief of Staff Earle G. Wheeler continued to stress their belief that ZEUS was a useful system for defending the nations. The generals also emphasized the fact that the Soviets were deploying active defense systems, and that U.S. failure to follow suit could lead to a "cold war defeat," if not a military weakness. 51 The Army thus inserted the question of Soviet ABM progress into the Congressional debate, and the analogy to the 1960 "missile gap" issue was not lost on the legislators.

51 Ibid., pp. 31, 131, 435.
Beginning in 1961, U.S. intelligence sources reported Soviet construction activity on an air defense system near Leningrad. The system was credited with an undetermined ABM capability, and the partial nature of the intelligence information left much room for speculation as to the size, effectiveness, and degree of operational status of the Leningrad installation. The OSD view of these developments tended to deemphasize the ABM potential of the system, specifically because the Soviet interceptors were relatively slow, short range vehicles which appeared to be modified anti-aircraft missiles.\footnote{Although much of the U.S. information of the Leningrad system was slow in filtering into the public record, there are a number of sources which discuss the nature of that ABM unit. See Lloyd Norman, "Nike-X," Army, March, 1967, pp. 29-30; and Richard J. Whalen, "The Shifting Equation of Nuclear Defense," Fortune, June 1, 1967.} It was believed by McNamara's advisors that U.S. ICBMs could quite easily defeat such an ABM system by virtue of speed alone. While the Leningrad defense might prove effective against certain missiles (SKYBOLT, HOUNDDOG, etc.) or slow IRBMs, it was deemed highly vulnerable to high-beta MINUTEMAN RVs.\footnote{Ibid., Norman, p. 29, and Whalen, p. 175.}

Because OSD did not credit the Leningrad system with any meaningful anti-ICBM capability, and because the administration wished to prevent NIKE-ZEUS advocates from dramatizing the fact that Russia had some operational ABM units while the U.S. did not, the recent intelligence reports were not presented to the Congress, even in closed session.\footnote{It is common practice for DOD to present the Congressional Armed Services Committees with periodical intelligence briefings on matters related to key defense policy issues. See Robert S. Allen and Paul Scott, "Red Anti-Missile Lead May Force Production of Nike-Zeus," The Shreveport Times, April 27, 1963.} However, the close relationships between certain key Congressmen and...
and military officials led to the leaking of this information to members of the Senate Armed Services Committee. Beginning in mid-March, these legislators initiated a campaign in the news media to dramatize the Soviet ABM system and the resultant "ABM gap." The leader in this effort was long-time NIKE-ZEUS advocate Senator Strom Thurmond of South Carolina. 55

Thurmond argued that the Soviets were years ahead of the United States in ABM work, and decried the lack of sophisticated decoys in the current U.S. ICBM force. The Senator, who at the time was a Major General in the Army Reserve, credited Kennedy's Science Adviser, Jerome Wiesner, as the chief reason why the President opposed NIKE-ZEUS. Thurmond's animosity toward Wiesner and other proponents of greater efforts toward eventual disarmament was evident as the legislator warned of the potentially fatal implications of an "ABM gap." 56

In seeking to draw attention to the administration's refusal to adopt Army plans for immediate ZEUS production, Thurmond asked the Senate Armed Services Committee to include in its FY64 military procurement authorization a provision for that ABM system's deployment. In making such a request, the South Carolina Senator directly challenged committee chairman Richard Russell, a Democrat who supported the administration position on the matter. In an initial vote on the issue, Russell obtained a 9 to 4 endorsement of his position. After Thurmond presented to the Committee the full set of intelligence data


56 Ibid., Anderson.
leaked to him, however, the group reversed itself, voting 9 to 8 to include a $196 million ZEUS procurement fund in its hardware authorization. 57

Senator Russell had warned that he would fight Thurmond when the measure came to the floor, and the South Carolina Senator took an unusual move in attempt to counter the administration's supporters. On Thurmond's request, the Senate went into secret session, the first time it had done so since the war year of 1943. In such a session, Thurmond was able to present to his colleagues the intelligence information, classified Top Secret at the time, concerning the Leningrad ABM. 58

This information included the following points: The Leningrad system, made up of at least 30 missiles, was deployed in an 100-mile arc around the city. The system was credited with being fully manned and capable of attacking U.S. ICBMs, in that its location placed the defensive line directly astride the "corridor" through which 90 percent of the SAC missile force would travel. 59

Thurmond described the Soviet ABM rockets as being modified versions of the SA-2 and SA-3 anti-aircraft series, the weapons credited with downing American U-2 reconnaissance aircraft over Russia and Cuba. He indicated too that SAMOS reconnaissance satellites had further established that these ABM missiles were mounted on mobile launchers,

59 Allen and Scott, Red Anti-Missile Lead May Force Production of Nike-Zeus." This news source appears to have excellent direct connections with key Southern Senators, and it is therefore deemed to be highly reliable on this particular matter.
capable of being shifted as target priorities might change.\textsuperscript{60} The Senator sought to tie this information to his efforts on behalf of NIKE-ZEUS by comparing the relative effectiveness of the two systems. Noting that McNamara and Harold Brown had earlier testified that even the unsophisticated ZEUS appeared to be much more advanced than the primitive Soviet system, Thurmond portrayed the Leningrad ABM as a highly effective weapon. Specifically, he cited intelligence reports indicating that the Russians had achieved multiple kills of RVs in recent tests.\textsuperscript{61} If a supposedly backward system could do this, how could the administration refuse to deploy the more sophisticated ZEUS?

Senator Russell made good his promise, however, and a combination of administration supporters and economy-minded Republicans rejected the $196 million ZEUS request by an overwhelming 58 to 16 vote. Russell had reiterated McNamara's position that NIKE-X was a much more capable ABM than the vulnerable ZEUS, and had emphasized that to wait for NIKE-X would yield a savings of some $2 billion which would otherwise be necessary to modify any initial NIKE-ZEUS deployment. The economy implications of this latter argument seemed particularly salient to the Senators, and in most cases appeared to outweigh doubts regarding the security implications of being without any ABM while waiting for NIKE-X to be developed.\textsuperscript{62}

\textsuperscript{60}Ibid.


In assessing the nature of the Senate's deliberations, it is important to clarify the problems associated with the intelligence data on the Leningrad system. Although the secret Senate session appeared not to have delved into these data in detail, later reports indicate the approximate status of the information available. Reconnaissance indicated the presence of an air defense system characterized by (a) interceptor missiles looking more like U.S. anti-aircraft rockets than ZEUS-type weapons, and (b) radar installations which were again reminiscent of U.S. aircraft defense units as opposed to the long-range ZAR used by the ZEUS system.\textsuperscript{63} It was much more difficult to arrive at useful assessments of the Soviet system's data processing capability, a crucial aspect of ABM system performance, but an aspect hidden from outside observers of the installations.

The Defense Department's evaluation of the Leningrad system proceeded by way of a direct comparison of that ABM with U.S. systems. Since none of the observable components of the Russian defense appeared to match the sophistication of even the much-maligned NIKE-ZEUS, the DOD assessment was that the Soviets had built themselves a cheap yet ineffective kind of primitive ABM. Given the projected inadequacies of ZEUS, the Leningrad effort was not thought by DOD to offer any real potential for intercepting U.S. ICBMs. In the words of one technical expert:

The fact is, we tried that route ourselves. We dabbled with the idea of developing a SUPER-TALOS, a long-range version with about 150-mile range. We dropped that pretty fast, however, in favor of the Army's NIKE-ZEUS which was

\textsuperscript{63}See Norman, pp. 29-30, and Whalen, pp. 175-176.
far more effective and could reach several hundred miles out to intercept a missile warhead coming in at speeds of about five miles a second. 64

Although the Leningrad system was credited by DOD with having a defense capability versus slow battlefield missiles and some IRBMs, its comparatively primitive nature compared to ZEUS led to serious doubts as to its ABM potential.

Adopting the kind of thinking which had characterized earlier Army positions on ABM systems, Senator Thurmond gave a quite different interpretation to the Soviet developments. Just as the Army had originally equated the solutions of the ICBM intercept problem with the capability for effective missile defense, Thurmond equated Russian live ABM test successes with high effectiveness for the Leningrad system. In an atmosphere where questions of relative U.S.-Soviet strategic weapons technology were receiving much attention, the South Carolina legislator hoped to generate a high level of Congressional emotion regarding the need to match Russian missile defense progress. By stressing the fact that the Soviets had a defense in place and by emphasizing DOD's position that ZEUS was a better ABM than the Leningrad system, Thurmond sought to overturn the administration's decision to shelve the Army's first generation defense system. By directly challenging Senator Russell and the Democratic leadership in the Senate, however, Senator Thurmond had perhaps underestimated the degree to which the advice of Secretary McNamara and his aides would be backed by administration supporters.

64 Quoted in Norman, ibid., p. 29.  TALOS is a 75-mile range anti-aircraft rocket used by the Navy.
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\textsuperscript{64}Quoted in Norman, \textit{ibid.}, p. 29. TALOS is a 75-mile range anti-aircraft rocket used by the Navy.
Strom Thurmond had lost his immediate fight, but he had succeeded in raising the ABM issue to a prominent status within the Senate. As various committees in the upper house became increasingly concerned with the strategic and technological implications of the proposed nuclear test ban treaty, legislators would repeatedly find the ABM question to be a central consideration in their deliberations. The matter of ballistic missile defense had come a long way from the situations in earlier years when technical arguments concerning U.S. systems performance dominated the debate. The issue now involved matters of comparative technological capabilities and prowess in strategic weapons between the U.S. and Russia. It further involved the political ramifications of alternative policy steps each of which was interpreted by some people as damaging to national security. Finally, the ABM issue had evolved into a complex debate over the uncertain status of that most feared of circumstances, nuclear war. The test ban debate, incorporating as it did these myriad uncertainties, placed the ABM question in a new perspective.
CHAPTER VI

NEW STRATEGIC PERSPECTIVES: THE NUCLEAR TEST BAN AND THE DESIRE FOR ARMS CONTROL

The ABM debate in the years since 1963 has been characterized by the presence of a number of new or modified strategic arguments put forth on either side of the deployment issue. Questions of the strategic ramifications of missile defense had historically been present in the debate, especially in the positions of ABM proponents, but NIKE-ZEUS opponents had concentrated more upon technical and economic critiques of the Army's proposed deployments. Army officials and their Congressional allies had in the 1957-63 period argued that an American ABM was required to counter the aggressive nature of the Soviet Union. In those years, the cold war atmosphere gave an air of necessity, if not urgency, to the strategic arms race with the U.S.S.R. As a result, even the strong opponents of NIKE-ZEUS did not stress the view that the system was undesirable because it represented a major new level of strategic weapons expenditures.

By 1963, the United States government was in the process of modifying its view of the necessity and desirability of continued strategic arms competition. The Cuban missile crisis in 1962 had left its mark on the President and his Secretary of Defense, and yielded a growing concern that steps had to be taken to curb the race for greater nuclear power. Hopes were raised when the U.S. and U.S.S.R. began substantive negotiations on proposals to ban nuclear testing, and the Kennedy administration became increasingly committed to the idea of strengthening
world security through tempering the arms race between the two great nuclear powers.

On July 25, representatives of the U.S., U.S.S.R., and Great Britain approved a draft treaty calling for the banning of nuclear weapons in three environments: Underwater, in outer space, and in the atmosphere. This partial, or "limited" ban resulted from the prolonged deadlock concerning testing in the fourth environment, underground. Failure of the participating nations to arrive at mutually acceptable policing and inspection mechanisms capable of detecting underground detonations had led to mutual agreement on the three-environment ban.¹

The debate which occurred as the United States Senate moved to ratify the test ban treaty is of particular importance to the ABM issue, and this chapter departs from the "budget cycle" format of this study to allow more detailed examination of that debate. The Senate's deliberations and the evolution of the administration's formal position on the treaty are of importance to the ABM issue for three reasons. First, the complex technological problems and phenomena associated with ballistic missile defense are dealt with in detail in the testimony heard by the Senate committees involved, and the public records of these hearings provide an excellent source of information on those issues--blackout, decoy discrimination, ABM kill mechanisms, etc.--crucial to assessments of missile defense performance.

¹See Jacobson and Stein, pp. 454-58, for a detailed review of the events surrounding the proposals for a limited test ban.
Second, the nature of the test ban debate illustrates a problem underlying the politics of complex technical issues, a problem which appears again and again in the ABM issue. Technological uncertainties foster disagreement among scientific experts, and such disagreement can be particularly frustrating to the lay legislator faced with the task of making decisions on such issues. Conflicting scientific views regarding the relationship between the proposed test ban and various nuclear technologies (especially ballistic missile defense) represented a major portion of the Senate debate, and reflected in turn the underlying differences in the views of the world held by the various protagonists. Finally, as noted above, the test ban debate occurred at a time when the Kennedy administration was becoming increasingly concerned regarding the strategic arms race. In the process of arguing for the test ban, administration officials strengthened their commitment to the goal of limiting that race, and in doing so, brought a major new argument into the arena of the ABM debate. The arms race avoidance or reduction view, voiced in the public debate by the Federation of American Scientists in late 1961, would become an integral part of the position of most ABM opponents.

Of the three major areas of uncertainty of importance to the test ban debate, two have been previewed in earlier discussion of the ABM issue. First, the characteristics of potential nuclear attack environments were not well understood, and the problems generated by multiple nuclear detonations had potentially fatal yet partially unknown implications for ABM systems performance. Because such uncertainty could best be reduced through further nuclear weapons tests, certain individuals
opposed the test ban on the grounds that national security would suffer unless the United States was able to continue to experiment in the atmosphere. The Secretary McNamara had provided a similar assessment in February of 1963 when he argued against ABM production on the grounds that the United States needed to gain much new knowledge in the atmospheric weapons effects area.

The second type of uncertainty concerned the relative status of the U.S. and Russia in general nuclear capabilities and technology. A test ban implied at least a partial "freeze" in whatever relationship currently existed between the two powers concerning such information. Although questions of weight-to-yield ratios and multi-megaton warhead knowledge were important, the central technological issue here was ballistic missile defense. Uncertainties regarding Soviet capabilities and intentions in these matters made for a volatile debate as to which side was "ahead" in various nuclear developments. The Senate's experience with Senator Thurmond and the Leningrad system in April gives some indication of the uncertainty inherent in the process of interpreting partial intelligence information pertaining to complex technological problems.

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2 This was the initial position of Senator John Stennis and other members of his Preparedness Subcommittee. See Marshall McNeil, "More Test Ban Data Sought by Stennis," Washington News, May 31, 1963.

3 DOD Appropriations for (FY) 1964 (House of Representatives), Part I, p. 126.

4 Supra., p. 185-188.
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The third area of uncertainty concerned potential trade-offs between the military benefits (through technical advancements) of continued nuclear testing and other objectives (arms control and general reduction of international tensions) associated with national security. In assessing such relationships, individuals were compelled in turn to take positions regarding the first two areas of uncertainty, i.e., the questions of the utility of further testing given unknowns concerning weapons effects and the relative status of the two great nuclear weapons technology. The manner in which the Kennedy administration evaluated these three areas and arrived at its advocacy of the limited test ban was important not only for the nature of the test ban deliberations themselves, but also for the future of the ABM debate.

The President's basic perceptions of national security included the belief that such security could be enhanced through conciliation and arms control as well as through continued build-ups in strategic weaponry. Therefore, if a test ban treaty could be constructed which did not result in significant military disadvantages to the United States, the potential gains which such an agreement implied made it highly desirable. In addition to the immediate benefits associated with the termination of radioactive pollution of the atmosphere and the tempering of East-West antagonisms resulting from competing test programs, the test ban had potentially valuable long-term payoffs. The basic elements of good will and peaceful intentions associated with the Geneva talks could be beneficial for future relations between the United States and the Soviet Union, even if the test ban itself had
little direct significance for arms reduction.\footnote{For indications of the President's position on these issues, see his address, "Toward a Strategy of Peace," delivered at the commencement of the American University, Washington, D.C., June 10, 1963.}

This belief that the political and strategic ramifications of the treaty were of great potential benefit to the United States did not arise, however, in the absence of calculations as to possible disadvantages in nuclear technology which the ban implied. In direct contrast to many critics of the proposed treaty, the Kennedy administration felt that the United States was basically in an advantageous position \textit{vis-à-vis} the Soviet Union in many areas of strategic weapons knowledge. Thus, for the second area of uncertainty described above, the President's technical advisors were of the opinion that, with some exceptions, U.S. knowledge of the types of scientific phenomena associated with atmospheric testing was superior or at least equivalent to that of the Russians.\footnote{This question of relative status of knowledge was the key aspect of the debate as far as many Congressmen were concerned. Later sections of this chapter will document the extent to which the administration was challenged on its assessment of this point.} The administration believed that this major yet gradually wasting U.S. superiority in nuclear weaponry and technology would decline more slowly, not less slowly, if a test ban were implemented.\footnote{See Kaufmann, \textit{The McNamara Strategy}, p. 159.}
as to the degree to which further atmospheric testing could remove the uncertainties involved. Only by exposing actual offensive forces and command and control systems to nuclear explosions could scientists predict with high certainty the true impact of phenomena such as EMP. Likewise, certain weapons effects had potentially fatal implications for ABM systems, but to DDR&E officials and other scientists, the familiar radar and computation problems which had long plagued missile defense systems represented much more immediate and serious difficulties. A test ban would prohibit testing of certain aspects of ABM performance, but so long as such defensive systems suffered from major difficulties (discrimination, saturation, etc.) which were unrelated to atmospheric testing, the administration concluded that it could design around the problems directly related to the test ban. 8

The President's support of the limited test ban was therefore based upon the belief that the technical difficulties implied by the cessation of testing in the three environments were more than balanced by the assumed political and strategic gains associated with the agreement. The administration's testimony to the Congress was built upon such an assessment, and was challenged by legislators and other participants who questioned Kennedy's calculus in one or more of the areas of uncertainty described above. Those who sought more information on weapons effects, those who regarded recent Soviet military and technological gains as having placed that nation ahead of the U.S. in crucial

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8A number of panels examined the ramifications of various test bans upon numerous weapons technologies. Two key groups here were the technical committee, made up of the AEC's Leland Hayworth, DOD's Gerald Johnson, and ACDA's George Rathjens, and the military aspects group, chaired by Paul Nitze. Interview L.
areas of weaponry, and those who saw little or no utility or practicality in the kinds of arms control objectives espoused by the administration all challenged the President's views. Central to much of this debate was the question of the treaty's implications for ballistic missile defense.

The proposed treaty was argued concurrently before two Senate groups during August. The primary forum was the Senate Foreign Relations Committee, the body charged with the formal responsibility of advising the Senate as a whole regarding ratification of the ban. In addition, Senator John Stennis' Armed Services Preparedness Investigating Subcommittee, which had heard testimony of the military implications of the test ban in May and June, reopened its investigation. Opponents of the treaty ensured that their side of the issue was heard by the committees, and the administration called upon Secretary McNamara and his military and technical advisors to detail the process by which the President had arrived at his advocacy of the agreement.

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ABM DEVELOPMENT AND WEAPONS EFFECTS DATA: A TECHNICAL DEBATE

Central to the Secretary of Defense's task of gaining Senate support for the treaty was the need to demonstrate that future development of ABM systems would not be seriously hampered by an atmospheric test ban. Within the administration, the issue had been framed in the context of comparative U.S.-U.S.S.R. technology, and it was the assessment of the President's advisors that the two nations were essentially on a par, and would thus be hampered in their nuclear technology development to equivalent degrees by the test ban. However, the Senators were quite concerned over the treaty's potential impact on particular U.S. programs, and asked for analysis of the kinds of uncertainty which the ban would create for American weapons designers. McNamara therefore provided the Foreign Relations Committee with a lengthy description of the administration's views on this element of uncertainty. He first outlined the relationship between ABM performance and various types of weapons technology:

In designing an antiballistic missile system, the major factors are reaction speed, missile performance, traffic handling capacity, capacity for decoy discrimination, resistance to blackout effects, and warhead technology. The last two of these items, resistance to blackout effect and warhead technology, depend on nuclear testing.

With respect to warhead technology, the United States now has the capability, without further testing, to weaponize a variety of possible ABM warheads, including those within the yield range desired by the designers of what is known as our NIKE-X system. These for larger warheads can be improved even further by underground testing under the treaty. The ABM system which we are now designing will provide us with a high confidence of achieving a low miss distance, a short distance between
intercepting missile and the incoming warhead. At such miss distances, the ABM warhead designs which we now have or can develop through underground testing will provide a high probability of killing Soviet warheads even if they incorporate advanced technology far beyond what now exists. 10

The Secretary had emphasized that defense scientists felt confident that the NIKE-ZEUS and SPRINT interceptors could be armed with effective warheads even in the absence of further atmospheric tests. As for the blackout problem, McNamara's statements indicated the presence of a much higher level of uncertainty as to the adequacy of current test information:

By theoretical analysis of presently available data, we believe we can adequately predict [blackout] effects over the range of yields and altitudes in which we are most interested. We will be able to design around the remaining uncertainties.11

McNamara elaborated upon his evaluation of the importance of this uncertainty in assessing ABM capabilities:

One important point stands out in connection with the antiballistic missile: The ABM problem is dominated by factors unrelated to the treaty--by reaction speed, missile performance, that is, the rate of acceleration of the intercept missile, traffic handling capacity, and capacity for decoy discrimination. A fuller understanding of the blackout phenomenon—which would result from tests prohibited by the treaty—might at most permit some reduction in the number of ABM radars required per ABM site. Thus, with or without a test ban, we could proceed with the development of an ABM system.12

This treatment of the blackout problem was challenged by Senators Goldwater and Stennis. Both men questioned DOD's future ability to decide

10 Foreign Relations Test Ban Hearings, p. 103.
11 Ibid.
12 Ibid., p. 104.
upon ABM deployment given the uncertainties involved. The Secretary responded by arguing that atmospheric testing would not be necessary to reach decisions on deployment: "We either have enough knowledge on which to base a design, or we can design around." Mc Namara noted too that both the Army and their ABM contractors, Bell Laboratories, concurred with this assessment.

Senator Goldwater felt that this statement still underestimated the potential dangers inherent in the inability to perform live ABM tests in the nuclear environment. Reinforced in this matter by the testimony of nuclear weapons experts Edward Teller and John Foster, the Senator questioned Mc Namara's position. The Secretary of Defense responded in specific terms, and in doing so indicated that the problem was one of degree, and that the administration was willing to accept

13 Ibid., pp. 138, 161. It was here that Mc Namara argued in contradiction to his February testimony to the House Subcommittee on DOD Appropriations. See supra., p. 181. In arguing against ABM deployment, the Secretary had indicated strong doubts regarding U.S. ability to design weapons without further testing of ABM-related weapons effects. In supporting the test ban, he de-emphasized the problems inherent in the uncertainties involved. (Although no new U.S. testing had taken place between February and August, it is conceivable that further interpretations of some of the 1962 atmospheric test data had allowed Mc Namara to feel more secure as to the adequacy of current U.S. information. However, this author has found no evidence to suggest that such an interpretation is valid.)


15 Foreign Relations Test Ban Hearings, p. 162, pp. 424, 466 (Teller), and p. 615 (Foster). Also Preparedness Subcommittee Test Ban Hearings, p. 576. Dr. Teller was the leading scientific opponent of the treaty, and Livermore Laboratories director Foster also voiced numerous doubts about the ban. Teller was explicit as to his views on ABM and the treaty: "The fact that an atmospheric test ban interferes with the development of our missile defense which had been given rightly a high priority is one of the most serious objections to the proposed test ban."
the ramifications of the situation:

We do have information associated with blackout. It is incomplete. I want to support [Senator Goldwater's] point on that. Our blackout information is not complete. But we have considerable information on it. And we have enough to allow us to design around uncertainties, which again, I emphasize, are there.... We already have a good deal of information on the nuclear effects relevant to an ABM system, from which we believe that we can adequately predict effects over the range of yields and altitudes in which we are most interested.16

The administration was describing the blackout problem as one about which the U.S. had some data and would design its missile defenses so as to allow for the disruptive effects of both enemy-initiated blackout and the so-called "self-blackout" caused by the ABM interceptors themselves. It was DDR&E head Harold Brown who analyzed the issue most cogently for the Senators:

We have done [blackout] experiments both in 1958 and again in 1962. That is where we learned about this phenomenon, and the systems that we are talking about are designed to survive in such a situation, to deploy additional radars, to be able to see, to allow for this blackout. We must, it seems to me, whether we know about it or not, design around the problem because...a big enough fireball cannot be seen through, you cannot make a radar that will see through it. That means you have to take other measures, and we are taking those other measures, having learned enough about blackout from the previous tests to take these other measures. The more we learned about it, the better we could do. But I want to make the point that this is a useful, but not a vital, additional piece of information.17

16Ibid. (Foreign Relations), pp. 162, 191. This view was echoed by JCS Chairman Maxwell Taylor before the Preparedness Subcommittee. See pp. 594, 611, 633, and 639 of those hearings.

17Ibid. (Foreign Relations), p. 570 (emphasis mine). See also Harold Brown's statement to the Preparedness Subcommittee, pp. 852-879. Los Alamos Weapons Laboratory director Norris E. Bradbury made a similar statement to the latter committee (p. 435) in reference to communications (as opposed to radar) blackout: "With what (we) have
McNamara and Brown had carefully limited their treatment of ABM systems to assessing the relationship between that area of technology and the proposed test ban. Although both men noted that ballistic missile defense faced serious technical problems unrelated to nuclear weapons effects, they generally avoided any direct statements evaluating the ABM deployment question. The presence on both the Foreign Relations Committee and the Preparedness Subcommittee of strong ABM supporters meant, however, that discussion of the advantages and disadvantages of NIKE-Zeus and NIKE-X would occur. In the latter forum, Senator Thurmond continued his efforts to gain support for the Army's Zeus production plans. The Senator hoped to elicit favorable testimony from two men in particular, JCS members Maxwell Taylor and Curtis LeMay. The Chiefs had reservations regarding the treaty, and the friendly atmosphere of the military knowledgeable Preparedness Subcommittee allowed the generals an opportunity to express their views.

Both Taylor and LeMay indicated that ratification of the test ban would yield an increase in both the costs and the uncertainties attendant to ABM development. When Thurmond tried to use these difficulties already observed...and a lot more theory, (we) may be able to produce a pretty good theorem or theory of what the communications problem really is. But admittedly that is one thing you cannot (determine with certainty) without atmospheric testing."

Dr. Brown did indicate at one point that DOD's rationale for rejecting the Army's most recent NIKE-Zeus deployment plan concerned the decoy-discrimination issue. See Foreign Relations Test Ban Hearings, p. 530.

Other test ban opponents in the Senate were critical of the treaty's implications for the ABM development. Senators Goldwater, Hickenlooper, Stennis, and Lausche all voiced such a belief. See W. D. Friedenberg, "Senate Battle Centers on Anti-Missile Missile," Washington News, August 14, 1963.
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as reasons for opposing the treaty, however, the general balked. Taylor noted that the Soviets faced the same constraints under the ban, and that the costs involved for the United States were acceptable given the potential advantages of the agreement.\textsuperscript{20} LeMay voiced the same skepticism of NIKE-ZEUS that the Air Force had maintained since 1957. Like Taylor, he saw the treaty raising the costs of missile defense, but unlike the JCS chairman, the Air Force chief viewed any such ABM expenditure as futile.\textsuperscript{21}

Senator Thurmond did receive testimony from certain expert witnesses who supported his view that the test ban would seriously hinder development of missile defenses. Both Edward Teller and John Foster provided pessimistic assessments of the uncertainties involved with estimating ABM capabilities without further testing. Foster, active in current nuclear weapons design research for the AEC, indicated that certain new technology in warhead design implied significant improvement in ABM performance. Only through further atmospheric tests could this mechanism be evaluated fully.\textsuperscript{22} Dr. Teller was especially concerned about the possible dangers of relying upon extrapolated design data for blackout and other phenomena, data derived not from atmospheric tests


\textsuperscript{21} Ibid., p. 379. Thurmond's efforts received quite similar results when he questioned the Air Force's leading R&D expert, Systems Command Chief General Bernard Schriever. See p. 829.

\textsuperscript{22} Ibid., p. 491. While the specific details are deleted from the public record, later developments would indicate that Foster probably referred to the design of exoatmospheric ABM warheads with greatly extended kill radii. Nuclear weapons expert Colonel Ray J. Clinton had made specific reference to such technology in earlier testimony to the Subcommittee (see p. 181).
but from underground detonations. While McNamara and Brown had indicated that they could accept the uncertainty involved in such a procedure, Teller indicated that he could not. 23

Just as Teller and Foster reinforced the positions of ABM advocates like Senator Thurmond, other witnesses backed Congressional opponents of the Army’s plans. In particular, two scientific experts who had been influential in ABM policy under President Eisenhower continued to doubt both the ultimate feasibility of missile defense and the impact of the test ban on that feasibility. Dr. Herbert York, who had been the first director of DDR&E, argued that atmospheric testing could remove only a minor portion of the many uncertainties plaguing ABM systems. York directly challenged Dr. Teller’s predictions of effective hardpoint ABM defenses, and was in turn countered by Senator Thurmond. The Senator cited the Kwajalein test program and indicated that eight of the first twelve intercept attempts had been successful. York replied that those tests did not satisfactorily simulate a realistic nuclear attack environment, and therefore could not be credited with having demonstrated the feasibility of the NIKE-ZEUS. 24

Former Presidential Science Advisor Dr. George Kistiakowsky provided two arguments in support of the administration’s position on both the treaty and ABM deployment. He detailed the major areas of uncertainty involved with missile defense, and stressed that future advancement in radar, computation, and interceptor acceleration technologies

23 Ibid., pp. 560-577.
were the most important aspects of ABM development at the present time. Kistiakowsky further argued that the great uncertainties in ABM performance which were related to atmospheric testing could not easily be overcome simply through the vehicle of renewed live tests:

Such [live ABM] tests are not likely to be very productive even with the best of efforts since they must be conducted against one's own, and not the adversary's, warheads. One can have as much, perhaps more, confidence from underground nuclear explosions properly instrumented, and ABM exercises that do not actually involve detonating warheads if coupled with a careful and continuing theoretical analysis taking into account all that is known from intelligence sources regarding the adversary's missiles.  

That portion of the test ban debate which dealt with questions of uncertainty in nuclear weapons effects reflected the complex nature of the technological and strategic factors influencing both the treaty itself and the ABM issue. The Kennedy administration, optimistic that the benefits of the test ban outweighed its negative aspects, was willing to accept the uncertainties associated with cessation of atmospheric nuclear tests. This willingness was reinforced by the attitudes held by many administration spokesmen regarding the utility of ballistic missile defense. The perceived high costs and low performance associated with current ABM technology made support of the treaty somewhat easier, in that the technological losses admittedly associated with the ban became much less relevant to national security once one assumed that ABM systems could not be made very effective under any circumstances.

25 Ibid., p. 854.
26 Ibid., p. 855.
The apparent paradox inherent in the position of Secretary McNamara between February and August concerning nuclear effects uncertainty was therefore not so inconsistent as it might seem. The basic objections to ABM deployment conveyed to the new Secretary of Defense throughout 1961 and 1962 went far beyond uncertainties of blackout and EMP effects. The arguments voiced by PSAC, DDR&E, the Air Force, and the Budget Bureau dealt with elements of nuclear strategy (the role of strategic defense in a deterrent posture), alternative defense measures (protection of offensive forces and passive civil defense), basic technical aspects of system performance (discrimination, saturation, interceptor and computation speed, battery hardness, etc.), and the problem of high unit costs.

For McNamara to add the uncertainties of the nuclear environment to this list in his February presentation to the House Appropriations panel indicated the extent to which the Secretary apparently felt the arguments to be overwhelming against NIKE-ZEUS deployment. DOD perceived many problems facing ABM systems, and the blackout issue was undeniably relevant. When the administration moved to secure ratification of the test ban treaty, however, that particular ABM difficulty could conveniently be deemphasized. If men like McNamara, Brown, and Wiesner had viewed the nuclear effects uncertainties as the only, or even the major, hindrance to ABM deployment, perhaps they would not have been so ready to discount the treaty's impact on the future success or failure of development of effective ABM systems. The presence of a multitude of other doubts about ABM feasibility, however, allowed such a discounting.
There was apparent paradox too in the position taken by strong supporters of the Army's ABM system. NIKE-ZEUS advocates, challenged for years by critics' citations of ABM technical problems, had generally tried to discount the importance of such objections to deployment. The extent to which men like Senators Thurmond and Stennis feared that the test ban would hinder ABM development, then, seemed to contradict their earlier position that technical arguments should not be allowed to delay ZEUS deployment. There were two major reasons why certain ABM advocates felt the way they did regarding the test ban. First, while Thurmond and others disliked DOD's opposition to current ABM technology, they shared the administration's desire to attain the highest possible level of missile defense system performance. These legislators were understandably concerned that inability to conduct live ABM tests would preclude the achievement of high ABM effectiveness.

THE STRATEGIC BALANCE: COMPARATIVE U.S. AND SOVIET WEAPONS KNOWLEDGE

Perhaps the strongest reason for opposition to the treaty by ABM supporters was based not so much upon the NIKE-ZEUS issue itself, but upon an underlying attitude which related to both the ABM and test ban questions. A central element of uncertainty attendant to the testing issue concerned the relative technical knowledge and weapons capability of the two principal nuclear powers. Much of the ABM support in the Congress was based upon the legislators' assessments that the Soviet Union, through either offensive or defensive weapons progress, maintained a potential or actual advantage over the United States in strategic nuclear forces. Support of increased U.S. strategic power, through ABM
deployment or other means, was the logical response for individuals perceiving such an unfavorable relationship between the two nations. Correspondingly, such a position led to opposition of the test ban or any other action which could freeze that disadvantageous relationship.

In supporting the proposed treaty, the administration thus found it necessary to present its own assessment of the comparative nuclear weapons knowledge issue. The Senators concentrated on two aspects of the comparative knowledge issue: Which nation had gained the greater amount of general data on nuclear weapons effects in the course of their respective atmospheric test series, and how did the Leningrad ABM system's sophistication compare to that of the United States' NIKE-ZEUS and NIKE-X? Both questions involved the highly uncertain process of expanding upon incomplete intelligence information, and the debate therefore found different people arguing conflicting interpretations, interpretations consonant with their basic beliefs on the broader issues under consideration.

A number of Senators participating in the test ban hearings were most concerned with the possibility that recent Soviet atmospheric testing had provided that country with a major lead in nuclear weapons knowledge. The fact that the Russians were willing to discuss a ban at all was seen by these legislators as convincing proof of such a situation, for why else would the Soviets even consider such a treaty? This underlying concern insured that questions of comparative technical knowledge would appear again and again in the course of the hearings. The opposing sides were able to construct their initial arguments in general terms, but persistent questioning by the Senators led to an
increasingly detailed debate concerning nuclear weapons testing and
ABM performance.

In discussing U.S. and Soviet information on ABM-related weapons
effects data, Secretary McNamara provided two arguments. He first noted
that for blackout-related information, "Soviet and U.S. experience ap-
ppears to be comparable although obtained in different ways." McNamara
went on to argue that whatever gains the Soviets had made in this area
should not be viewed as troublesome for the U.S. Because ABM de-
velopment required major improvements unrelated to atmospheric testing,
the ban issue could be deemphasized in discussions of ABM capabilities.

This assessment was challenged by two sources, both of which offered a
differing evaluation of comparative weapons effects data. JCS Chairman
General Maxwell Taylor noted that, for ABM-related information, "there
is evidence that the Soviets are further advanced than the United
States." Although Taylor qualified his statement by noting that the treaty
would "not significantly influence any imbalance that may exist," a
second major witness provided a strong contradiction to McNamara's argu-
ment. Dr. Edward Teller told the Foreign Relations Committee that:

Secretary McNamara has told you that on missile defense
the Russians have probably no more information than we do.
How does he know? There are some experiments which are
unmistakably designed for missile defense. These are few,
but in very many other experiments, apparatus may have been

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27 Ibid., p. 103. A similar view was presented to the Prepared-
28 Ibid., p. 103, 115, 163. The major area to which McNamara
referred was the decoy-discrimination problem.
29 Preparedness Subcommittee Test Ban Hearings, p. 588.
30 Ibid.
around, probably was around, that looked at effects relevant to missile defense. What we must say is that they had three or perhaps four times more opportunity to find out the relevant facts on missile defense than we had. 31

Teller argued that the recent U.S. high-altitude test program was hastily conducted, and yielded some "quite disappointing" results. These assessments were seconded by Air Force General Bernard Schriever in testimony to the Preparedness Subcommittee, and thus both Senate hearings faced contradictory advice on the question of comparative testing informations. 32

The Senators were unable to resolve this disagreement through any simple assessment of the number of ABM-related tests conducted by either side. Detonation of a nuclear device was only a part of complex weapons effects testing. The key to accumulation of valuable data was instrumentation. What kinds of monitoring devices had been used, and how extensive was the information gathered? 33 Teller's point was that the Soviets had had more chance (more recent tests) to gather relevant data, and that one had to assume that the necessary instrumentation had in fact been utilized. The extreme complexity of the devices designed to monitor thermal X-ray emission, atmospheric ionization levels, and neutron flux led at least one technical expert to challenge Teller's view. Dr. Norris Bradbury described the form of Soviet testing and noted

31 Foreign Relations Test Ban Hearings, p. 422.


33 Technically-oriented hearings held earlier in 1963 yielded detailed analyses of the instrumentation question, especially on the U.S. side. See the March sessions of the Joint Committee on Atomic Energy, Developments in Technical Capabilities for Detecting and Identifying
that the methods observed by U.S. intelligence "doesn't seem to make it obvious that they have a very elaborate diagnostic program." \textsuperscript{34}

The difficulties inherent in assessing actual Soviet testing knowledge and the fact that the 1962 U.S. test data had not yet been fully evaluated left the issue of general nuclear weapons effects data comparability between the powers basically unresolved. In the end, the administration appeared to satisfy most of the Foreign Relations Committee members that, while uncertainty obviously existed in this area, it was acceptable. If the nature and tone of the Senators' questioning may be used as a guide, it further appears that the testimony of a key administration witness was instrumental in persuading that committee that the test ban would not place the United States in a disadvantageous position regarding nuclear testing knowledge. \textsuperscript{35}


\textsuperscript{34} Foreign Relations Test Ban Hearings, p. 600.

\textsuperscript{35} The Preparedness Subcommittee remained unconvinced regarding the administration's position, and filed a report which backed Teller's view. The Subcommittee concluded that the treaty would "result in serious, and perhaps formidable, military and technical disadvantages (for the U.S.)." See Interim Report on the Military Implications of the Proposed Limited Nuclear Test Ban (1963), p. 11. This assessment was based primarily upon unfavorable conclusions regarding the two areas of comparative technology discussed in this chapter, i.e., general weapons effects knowledge and ABM systems performance. For a detailed discussion of the test ban as viewed by an author sharing the Subcommittee's perceptions, see James H. McBride, The Test Ban Treaty (Chicago: Regnery Press, 1967).
The witness who dealt most specifically with the weapons effects issue was DDR&E head Harold Brown. This strong opponent of the Army's NIKE-ZEUS argued that his reading of intelligence on Soviet testing showed no Russian tests of a live ABM missile or efforts to intercept an actual ICBM. On the other hand, the United States had at least done the latter. Brown described the 36-test U.S. atmospheric program in 1962 as being well planned, and indicated that not just DOD, but the entire complement of major public and private organizations involved in ABM work (the Army, Bell Labs-Western Electric, Lincoln Laboratory, Institute for Defense Analyses, etc.), believed that the amount of knowledge gained by the U.S. in these tests meant that the test ban would not hinder ABM development.

The DDR&E director explained that the United States had conducted approximately 200 atmospheric tests, compared to some 180 by the Soviets. He disagreed with the JCS view that the Russians were ahead, even in the area of high-yield weapons, an aspect of testing in which other administration officials had tended to concede a Soviet advantage:

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36 Foreign Relations Test Ban Hearings, p. 543. The conflict between the testimony of Brown and information regarding Soviet ABM tests in 1961 and 1962 appears to stem from different meanings of the term "live." While the Soviet tests had utilized actual nuclear ABM warheads, these efforts probably did not utilize a fully operational ABM ground environment of integrated radars and command/control equipment. In addition, there was no information to indicate that the target vehicles were armed, and these RVs were probably traveling on short, non-ballistic (and thus unrealistic compared to actual ICBMs) trajectories. See supra., p. 143-144.

37 Ibid., p. 522.
I consider [the question of comparative information to be] not a military question but a technical question, and my interpretation of all the data, and it is available to the Chiefs as well as to me, indicates that although they have done more high yield tests those were not effects tests. Their geography, and the associated activity does not indicate to me that they are effects tests.... With respect to high altitude blackout, the Chiefs say the Soviets may have some data that we do not have. I would say yes, and we have some data that they may not have.38

In assessing the uncertainties involved in estimating comparative nuclear testing information, those Senators for whom the ABM issue was not a matter of great urgency were able to accept the kinds of arguments advanced by Brown. These legislators were generally willing, as was the administration, to concede the chance that Soviet knowledge exceeded that of the United States in some areas. However, there appeared to be equally strong reasons for making the opposite assessment, i.e., that the United States possessed the advantage in most areas. Further, it could be argued that the proposed treaty would probably do little to increase any existing U.S. disadvantage in any case.

The debate over which nation would find the treaty more advantageous did not end, however, with the issue of general nuclear weapons knowledge. Congressional and military advocates of the NIKE-ZEUS system continued to dramatize the fact that the Soviets had deployed an ABM system while the United States had not. Because the Defense Department had argued that further performance information had to be

38Ibid., pp. 563-64. For a more pessimistic assessment of the U.S.-U.S.S.R. relationship in high-yield technology, see Secretary McNamara's statement, pp. 99-101.
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obtained prior to a U.S. ABM deployment, ZEUS supporters argued that
the treaty would prevent the administration from ever producing the
Army's missile defense system.

The leading technical spokesman in opposition to the test ban,
Dr. Teller, did not tie his ABM-related arguments against the treaty
directly to the issue of the Leningrad system. In an effort to elicit
testimony favorable to ZEUS, Senator Thurmond and his supporters sought
to raise the issue of the Leningrad defense as they questioned the
Joint Chiefs and their aides regarding comparative U.S.-Soviet ABM
capabilities. The military testimony to the Preparedness Subcommittee
offered a mixed assessment of the relative ABM prowess of the two na-
tions. General Taylor, while noting the uncertainties associated with
missile defense which would result from the treaty, emphasized that
this problem would be the same for the Soviets as for the United States.
This view was supported under detailed questioning from Senator Gold-
water by both General Wheeler and Army ABM expert Colonel C.J. LeVan.

Air Force testimony alluded to Soviet advantages in ABM knowledge, but
viewed the Leningrad system as basically ineffective against American
ICBMs.

Test Ban supporters on the Foreign Relations Committee, critical
of the actions taken by Senator Thurmond on the ZEUS issue, sought to

39Thurmond had accused McNamara of trying to deceive the Senate
regarding ABM systems: "The clear fact is that we are not ahead of
the Soviets in either technology or weaponry in the ABM field." Quoted
by E. W. Kenworthy in "McNamara Scored on Test Ban View," New York
Times, August 24, 1963.

40Preparedness Subcommittee Test Ban Hearings, pp. 611, 633, 639
(Taylor); 661-62, 671, 679 (LeVan); and 665 (Wheeler).

41Ibid., p. 760 (LeMay), p. 829 (Schriever).
elicit counter-arguments regarding the strategic significance of the Leningrad ABM. When asked by Senator Clifford Case to comment on the charges by Thurmond that the administration was suppressing intelligence on Soviet missile defenses, General Taylor stated that he did "not agree with any of the matters of substance" raised by the South Carolina Senator in a recent article on the issue. Harold Brown made almost identical statements to both committees, stressing the DOD view that the Leningrad system was of "low quality," "less sophisticated than the NIKE-ZEUS." After Foreign Relations Committee Chairman J. William Fulbright had applauded Herbert York's critical evaluation of ABM feasibility, Thurmond and York engaged in what was to be the hearing's final detailed discussion of U.S. and Soviet missile defense capabilities. York argued that the Russian ABM deployment was an ineffective and primitive system, and Thurmond challenged that assessment, claiming that U.S. intelligence credited the Leningrad defenses with an anti-IRBM and anti-cruise missile capability. York's reply was a blunt one:

Anybody can put around some missiles and say, 'I have got an antiballistic missile system.' It is quite a different thing to have one that would work. I stand on my belief that it won't work. The former DDR&E chief further criticized Thurmond's interpretation of

\[\text{Foreign Relations Test Ban Hearings, p. 320-321. The article referred to here was John Henshaw's "Washington Pipeline," National Inquirer, Vol. 37, August 25, 1963. The Joint Chiefs' formal statement on the treaty, inserted into the record earlier by Taylor, evaluated the test ban as "not significantly influenc(ing)" competitive ABM status (p. 314).}\]

\[\text{Ibid., p. 530. See also Preparedness Subcommittee Hearings, p. 860.}\]

\[\text{Ibid. (Foreign Relations), p. 777. See also pp. 763-64, 778-79.}\]
the available intelligence information. For York, there was no way that the system which the Soviets had installed could operate as an effective ABM.

The administration's unyielding arguments that ABM technology was not destined to provide a very effective defense capability had succeeded in overcoming most of the Congressional concern regarding the second area of uncertainty discussed here, the question of comparative nuclear weaponry knowledge and ABM technology capabilities for the United States and the Soviet Union. Civilian Defense Department officials, led by McNamara and Brown, took the position that it was just as logical, given the incompleteness of the relevant intelligence information, to perceive a U.S., as opposed to a Soviet, advantage in test ban-related nuclear technology. Even those military experts who were inclined to make the more conservative assessment of the comparative knowledge situation generally accepted the administration's position on ABM systems. The Joint Chiefs of Staff, while concerned that the Soviets had technological advantages in certain areas of nuclear weapons information, argued that the specific issue of potential ABM development should not represent a justification for opposing the treaty.

Doubts about the ultimate feasibility of ballistic missile defense had led many individuals to deemphasize the test ban's impact on ABM technology. Military advocates of ballistic missile defense, realizing the President's commitment to the treaty, likewise sought to decouple the nuclear testing and ABM development issues. Army testimony thus supported both the treaty and ABM development, arguing that support of the former would not seriously hinder successful attainment of the
latter. Opponents of the test ban whose position was based upon the feeling that the Soviet Union was receiving the greater benefit from the treaty used the ABM issue as a principal argument in support of their stand. So long as the uncertainty related to ABM performance was closely related to nuclear weapons effects knowledge, these men could use the existence of the Leningrad system to argue that the Soviets possessed ABM-related testing data as yet unobtained by the United States.

ABM AND ARMS CONTROL: THE STRATEGIC INTERACTION ISSUE

Well prior to 1963, there had existed in some quarters the feeling that future large-scale additions to U.S. or Soviet strategic weaponry would represent dangerously destabilizing actions in an atmosphere already imperiled by great fear and uncertainty regarding nuclear war. Anything as major as a multiple-city ABM deployment by one of the powers was viewed as the instigator of an inevitable countermove by the other nation, with the result being a rapidly accelerating and futile arms race. This viewpoint found much of its support in the American scientific community, a group whose concerns about nuclear war had grown steadily since Hiroshima.45 While the argument that ABM deployment

would lead to great strategic instability had been voiced publicly in earlier years, this position had not been present in deliberations at the Presidential level on the ABM issue.  

The position taken by President Kennedy on the limited test ban contributed to the ultimately high saliency of the strategic interaction argument in the ABM debate. The potential dangers inherent in a continued and heightened strategic arms race had been motivating factors in the administration's drive to secure a workable test ban. The President's espousal of arms control objectives in conjunction with the treaty led to opposition from individuals whose distrust of Soviet motives was so great as to generate the belief that any test ban-type agreement with that nation would be dangerous. The danger was seen to be twofold: First, Russian acceptance of the treaty was viewed by these men as an indication that the Soviets had developed weaponry which the United States had not. Second, difficulties in detecting and punishing test ban violations were perceived as open invitations to non-compliance by the U.S.S.R.

While it is impossible to state categorically that neither Eisenhower nor Kennedy were ever exposed to this view in conjunction with the ABM issue prior to 1963, this author's interviews with numerous individuals involved with the ABM issue at the White House level in these years yielded unanimous agreement that the strategic interaction/instability view was not present at the Presidential level prior to the test ban debate. A more general concern with the arms race, underscored by the Cuban missile crisis, was beginning to emerge before mid-1963.

See Jacobson and Stein, Part III. Many individuals believed that a ban would yield an ever-widening security gap because the Soviets would clandestinely ignore the ban and continue testing, while the U.S. adhered to the agreement.
As earlier discussions of the positions of Senator Thurmond and his supporters have indicated, much of the Congressional backing of the Army's ABM systems was based upon these same unfavorable assessments of Soviet motives and capabilities. This, combined with the undeniable relationship between ABM technology and nuclear testing, assured that critics of administration policy on testing and ABM deployment would interrelate the two issues. This tying together of support for NIKE-ZEUS and opposition to the test ban had an important effect upon the position taken by the Kennedy administration. While the most salient DOD objections to ABM systems continued to be technical, the administration's advocacy of the treaty complicated such argument. It was politically difficult (while generally valid from a technological standpoint) to argue in the same breath that (a) ABM deployment should be deferred due to technical problems and uncertainties, but that (b) a test ban was acceptable because the ban-related uncertainties relevant to ABM systems were not overwhelming vis-à-vis successful missile defense development.

This is essentially the argument which the administration made to the Senate in seeking ratification of the limited test ban. Much less prevalent in the Senate hearings was discussion of the strategic interaction question, even though this issue provided an underlying motivation for the actual technical debate. It is here that one may attribute reasons for the later emergence of the position which viewed ABM systems as instigators of dangerous strategic instability. As noted above, the strategic instability argument had been present for some years, but
it had not played any significant role in the weapons acquisitions policies of past administrations.\textsuperscript{48} This argument did gain major attention, however, in the course of the Kennedy administration's internal and external justifications of its stand on the test ban.

A number of key participants in the ABM debate, including Robert McNamara, Harold Brown, Jerome Wiesner, Herbert York, and George Kistiakowsky, had been exposed to the strategic instability view before, and McNamara in particular had been directly concerned with the issue from the time he was appointed Defense Secretary in 1961. As these men began to argue the President's case in the test ban debate, that particular argument became increasingly important for them.\textsuperscript{49} Not only did the strategic instability position argue for the treaty, but it also related to the ABM deployment question. The form of the Senate debate required that administration supporters constantly oppose ABM deployment as they advocated the test ban. It is not strange, therefore, that rationales for one of the two interrelated arguments gradually became associated with the other argument.\textsuperscript{50}

\begin{footnotesize}
\textsuperscript{48} In fact, arguments had been voiced in the Eisenhower years which perceived the arms race implications of the strategic interaction phenomenon as beneficial. See \textit{supra.}, p. 102.

\textsuperscript{49} This observation has been documented through interviews with a number of the individuals involved.

\textsuperscript{50} The Foreign Relations Committee did receive into its official hearings record a statement which used the strategic instability position to argue both for the treaty and against the deployment of ABM systems. See the statement of the Federation of American Scientists, presented by physicist Freeman J. Dyson. \textit{Foreign Relations Test Ban Hearings}, pp. 895-99.
\end{footnotesize}
A new strategic argument had entered the ABM debate. After years of viewing the nuclear arms race with the Soviets as a necessary and inevitable reality of the cold war, the United States government had finally--through the test ban treaty--demonstrated its acceptance of the idea that reduction of that arms race was a valid objective for current national policy. At the very time at which opponents of ABM deployment found their previous technical objections to ballistic missile defense becoming less potent, these men found the strategic instability argument available to counter the strategic rationale for deployment put forth by ABM advocates. The Senate's ratification of the Limited Test Ban Treaty on September 24, 1963, marked the beginning of a new kind of debate on the ABM issue. 51

In the years beyond 1963, the increased saliency of strategic arguments both for and against ABM deployment changed the tone of that debate. Discussion of ballistic missile defense turned increasingly toward evaluations of the strategic impact of such weapons. What would an ABM deployment cause an enemy to do, both in terms of weaponry and foreign policy? How did a nation's perceptions of the nature of nuclear warfare interact with the potential or actual deployment of a ballistic missile

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51 The Senate vote was 80-19. The lopsided margin hides an important point for the future of the ABM debate. Of the 19 opposition votes, 10 came from members of the key Senate committees which annually deal with defense policy. From this group of 19 would come many of the men who would continue to advocate ABM deployment in later years. For a listing of these Senators, see Jacobson and Stein, p. 463 (footnote).
defense? The ABM debate came to require that its participants express in specific terms their perceptions of the strategic situation in the world and then relate missile defense to those images. Questions of ABM costs and effectiveness by no means disappeared. Instead, these calculations were complicated by the difficulties inherent in assessing the kinds of utility associated with alternative long-term defense policies. ABM deployment could have ramifications which were incalculable in monetary terms, ramifications associated instead with questions of peace and war, stability and instability.
CHAPTER VII

ANALYSES OF THE STRATEGIC FORCE STRUCTURE:
NEW TECHNIQUES YIELD NEW IDEAS

The changes which 1963 brought to the ABM issue were by no means confined to the evolution of NIKE-X technology and the signing of the Nuclear Test Ban Treaty. At the same time that the United States was debating the test ban, the Defense Department was engaged in a process of study and analysis which was to influence both the ABM issue and general nuclear war strategy in the years to come. For the first time since 1957, the political debate on ABM policy quieted somewhat. Army and DOD scientists were closer to agreement as to the technical capabilities of NIKE-X, and these assessments viewed the new missile defense as much more effective than its predecessor. In addition, both sides of the ABM debate realized that decisions on NIKE-X deployment would be made only after radar and missile development had demonstrated design feasibility, and such a point would not be reached before late 1964. Thus, the urgency which had characterized the deployment debate in previous years yielded to an atmosphere of cautious optimism on the part of NIKE-X supporters.

By early 1963, Secretary McNamara found himself faced with program funding questions concerning a wide range of strategic defensive systems. The Army's NIKE-X, the Air Force's improved bomber defenses, the Navy's advanced ASW, and civil defense were all competing for resources, and OSD sought to obtain a perspective through which to evaluate these alternatives. To date, the techniques of systematic analysis
utilized by McNamara's staff in examining strategic offensive forces had not been applied extensively to defensive systems. In May, 1963, the Secretary directed Air Force General Glen A. Kent to supervise a group of studies which applied cost-benefit analysis and war gaming to strategic defenses. These "Damage-Limiting" studies, the first of which was presented to McNamara in June of that same year, captured the Secretary's imagination.

The Damage-Limiting Studies utilized a number of important concepts and techniques which were to influence not only the specific issue of ABM deployment, but the entire strategic nuclear war planning and force design process in later years. The concept of damage limitation had been an integral part of the strategic thinking of advocates of counterforce for some time. For the counterforce school, the most interesting kinds of nuclear exchange scenarios were those which pictured essentially all of the attack from both sides as being directed at enemy military forces. These scenarios yielded support for both civil defense (to protect cities from the heavy fallout attendant to counterforce strikes on hardened military targets) and aircraft defense (to prevent Soviet bombers from enjoying a "free ride" in attacking the U.S.). Thus, although damage limitation was central to most counterforce positions, it derived from the manner in which the nuclear exchange transpired, not from the extensive utilization of active defenses (especially ABM systems) to defend cities. If utilized by both sides, counterforce targeting could result in exchanges in which, if adequate shelter systems existed, destruction of cities and population loss
would not be extensive.¹

In the Kent studies, however, the damage-limiting concept was viewed as a specific and independent strategic objective which could be partially fulfilled by each of a multitude of offensive and defensive systems. In constructing various scenarios and calculating fatalities and systems costs, the Damage-Limiting studies emphasized two important concepts. First, the level of analysis was national, and examined the overall results of full attacks on the United States. Earlier Army analyses of ABM effectiveness had been calculated on a single battery, or unit, basis. Because they dealt only with single targets, these latter orientations did not allow ABM deployments to be viewed as general contributors to national defense.

Second, the Kent studies demonstrated the manner in which a mix of various active and passive strategic defense systems provided a force structure less vulnerable to enemy countermeasures than a force built upon only one or a few different defensive systems. While the Army had sought previously to examine U.S. ABM deployments only in relation to Soviet offensive missiles, the Damage-Limiting studies indicated that an enemy obviously had many offensive options, including

¹In order to limit damage should such a nuclear exchange actually occur, some counterforce advocates favored public emphasis on a city-avoidance philosophy in target selection. This concept could go so far as to yield avoidance of some enemy military installations if their locations were so close to population centers as to result in collateral civilian casualties. The counterforce philosophy would achieve its damage limitation goal only if the enemy could be persuaded to adopt similar targeting. As an incentive to Soviet compliance, the counterforce school advocated the maintenance of an offensive reserve substantial enough to deter enemy attacks on cities.
not only ICBM forces, but bombers and submarine-based missiles, available to counter a system like NIKE-X. In the absence of equivalent aircraft defense and ASW systems, an enemy might choose to overcome an ABM not by building enough additional ICBMs to saturate the missile defense but by simply bypassing the ABM, inflicting equivalent damage through other means. If air defense and ASW were not built up along with ABM defense, this bypassing could potentially accomplish the desired levels of damage even more easily than could attempts to defeat the ABM directly. Thus, the earlier analyses' investigation of ABM systems versus the single enemy response of building more ICBMs did not yield an accurate view of the potential options open to an attacker.

In analyzing the nuclear attack environment, the Kent group utilized some key assumptions held by Secretary McNamara regarding potential forms of strategic warfare. It was McNamara's argument that the relatively small size and vulnerable character of Soviet offensive forces made it essential that any Russian first strike against the United States be directed primarily or even totally against population centers. This timing sequence was crucial for assessments of the relative damage-limiting capabilities of offensive and defensive forces. If a Soviet attack concentrated first on U.S. offensive forces, holding a strategic reserve for a later countercity assault, then American offensive forces surviving that first wave of attack could significantly limit damage by counterforce targeting of the residual Soviet forces.

Interview M, Interview J.

It was this latter type of scenario which had in 1961-1962 led OSD to the conclusion that offensive forces were more capable in the damage-limiting role than were the expensive and perhaps ineffective active defenses. However, the scenario favored by McNamara yielded a more optimistic assessment of purely defensive systems. If the first wave of a Russian attack was to be directed against cities, then a major portion of the damage-limitation could be accomplished only by systems which \textit{physically} protected population. There obviously was no time available for U.S. \textit{counterforce} targeting against weapons which were launched in the opening salvo (counterforce targeting \textit{did} retain a significant damage limitation capability in its ability to destroy residual enemy forces capable of being launched in later salvos.)

\footnote{This calculation further favored the offensive forces in that these weapons were \textit{dual-capable}, i.e., they could alternatively limit damage in a counterforce role or inflict casualties in a countercity context. Certain studies had \textit{credited} defensive systems with a similar two way contribution—as early as 1957 a RAND Corporation analysis (see supra., p. 40.) saw ABM systems as useful for assuring destruction of an aggressor through protection of offensive retaliatory forces. However, current (1963-64) OSD planners viewed the cost differences between ABM systems and other less costly techniques (hardening, dispersal, alert status, additional offensive forces) for assuring U.S. 2nd strike destruction capability as being so great that active missile defenses were simply not interesting as assured destruction devices. Interview J, Interview N. The idea of "HARDPOINT" ABM deployments to protect U.S. ICBMs was by no means dead, however, and continuing studies at RAND and elsewhere supported such a role for missile defense. See, for example, "DOD Plans $125-Million Anti-ICBM Effort," \textit{Aviation Week and Space Technology}, Vol. 80, January 20, 1964, p. 31.}

\footnote{Unlike U.S. ICBMs, the Soviet missile force of the day was unable to launch all of its ready missiles in a single salvo. A number of Russian launchers were equipped with more than one missile, and would have to undergo a reload period prior to launching second or third ICBMs. See \textit{Missiles & Rockets}, August 10, 1964, p. 14.}
Although the Kent studies improved the status of ABM systems in this respect, they inserted an issue which came to be used as a key roadblock to the proponents of NIKE-X. Among the alternatives to ABM systems which were available to protect population, the system which appeared most effective (in the $1-5 billion range of expenditure) was a fallout shelter program. In calculating the costs and payoffs associated with initial expenditures for city defense, the Damage-Limiting studies viewed shelters as saving more lives than would an ABM deployment of equal cost. The analysis indicated a rather major difference in the effectiveness of the two systems. One publicly released citation gave the following figures for initial expenditures on shelters and ABM defense:

<table>
<thead>
<tr>
<th></th>
<th>COST (BILLIONS)</th>
<th>LIVES SAVED (MILLIONS)</th>
<th>COST PER LIVES SAVED</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALLOUT SHELTERS⁶</td>
<td>$ 2</td>
<td>48.5</td>
<td>$ 20</td>
</tr>
<tr>
<td>NIKE-X SYSTEM</td>
<td>$ 18</td>
<td>27.8</td>
<td>$ 700</td>
</tr>
</tbody>
</table>

The Kent group therefore recommended that any expenditure for ABM systems should be preceded by funding of a major fallout shelter program. The "buy shelters first" position, previously voiced by McNamara in his FY64 posture statement, had been reinforced by the analysis of OSD and service experts.

A final concept emphasized by the Damage-Limiting studies concerned an analytic technique which had been present in OSD studies for some

time. In examining the utility of alternative defense measures, OSD officials devised an offense/defense cost exchange ratio scheme. Such ratios expressed the incremental costs of offensive measures required to overcome particular levels of defensive expenditures. When calculated on a single-battery basis, this ratio for the NIKE-X emerged as an unfavorable 10 to 1 in favor of the offense.\(^7\) In other words, for an ABM expenditure of 10, it would cost a potential adversary only 1 to buy enough additional offensive capability again to achieve pre-ABM damage levels.

This argument, plus the fact that the point defense nature of NIKE-X yielded either unacceptably costs (if most or all major cities were to be defended) or left entire cities vulnerable (if less extensive, thus less expensive, deployments were used), bolstered the administration's strong opposition to any ABM production in 1962 and 1963. While granting the technical superiority of NIKE-X over NIKE-ZEUS, the majority of civilian DOD personnel viewed ABM systems to be relatively ineffective against a determined opponent and much too costly in light of that low level of performance.\(^8\) The cost exchange ratio argument underwent a major change in late 1963, however, as the techniques employed by General Kent's study group were adopted by a second defensive systems analysis.

Secretary McNamara's enthusiasm regarding the approach and findings of the initial portions of the Damage-Limiting study led him in

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\(^7\)Fink speech, p. 5.  
\(^8\)Ibid., p. 6.
August of 1963 to request the Army to conduct an extensive "Threat Analysis Study" designed to complement the Kent study. The Threat Analysis Study drew heavily upon the methods employed by the earlier effort, and McNamara specifically directed the Army to utilize the concepts of "national effectiveness" and substitutability of various offensive and defensive systems in the damage-limiting role. The Army study, directed by Major General Austin W. Betts, reinforced many of the findings of the earlier study, and added some important concepts to the debate over ABM deployment.

The Threat Analysis Study agreed with the Kent study that damage limitation involved a package of defensive measures, and could not be properly fulfilled through piecemeal procurement of only certain types of defenses. This was by no means an insignificant point, because, in carrying this perception through the analysis, the Betts group accepted the "buy shelters first" proposition. The Army was therefore accepting as valid the very argument which OSD would use in the next two years to oppose ABM procurement. The fact that the shelter question was a dead issue politically--public and Congressional opinion had remained highly negative--meant that the presentation of shelters as a prerequisite to NIKE-X deployment was an effective roadblock for ABM advocates.

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9 Interview M. See also James Trainor, "Nike-X Fate Keyed to DOD Study," Missiles & Rockets, Vol. 14, May 18, 1964, pp. 14-15. Many other organizations (DDR&E, IDA, Stanford Research Institute, Hudson Institute, and others) in addition to the Army contributed to the Threat Analysis studies.

Other conclusions of the Threat Analysis Study also had important consequences for the ABM issue. One such finding concerned the implications of scenario variations upon the cost exchange ratio argument. As one analyst described the study's findings:

The cost ratio between defense and offense turned out to be a strong function of the percentage of the population protected [and upon the type of exchange postulated by the particular scenario]. This no doubt seems obvious. If we insisted on protecting every man, woman and child in the U.S. with strong terminal defenses, then we would have SPRINTs deployed in every hamlet at astronomical cost. The offense can concentrate his attack where he pleases, and can always secure a small percentage of fatalities, no matter how much the defense spends. If we settle for defending the larger cities where the major part of population lives, then the cost ratios drop. With terminal defenses..., protecting 80-90% of the population might result in a cost ratio of 10 to 1, or higher, favoring the offensive, but at the 55-65% level was about 1 to 1.\(^{11}\) (emphasis mine)

In addition to indicating cost exchange ratios more favorable to defensive systems, the analysis noted that ABM deployment had major ramifications for both the design and targeting of enemy offensive forces. First, an attacker faced with ABM batteries in the opposition's major cities was forced to deal with new issues of target selection. If he wished to produce maximum fatalities, he had to shift targeting from defended cities to smaller, unprotected ones. Insistence on a rank order attack (hitting the largest city first, regardless of defenses) led to a substantial reduction in the number of fatalities inflicted.\(^{12}\)


\(^{12}\)The validity of this argument was dependent upon the size of the enemy offensive force being defended against. For Soviet missile forces above a certain level, point defenses of a few large cities did not imply the kind of reduction in fatalities argued here. For such large ICBM forces, enough warheads could be available to allow saturation attacks on defended cities plus targeting of smaller, unprotected cities.
Another concept which emerged from the Threat Analysis Study was the idea of "virtual attrition." The presence of an enemy ABM would lead a conservative offensive force planner to take steps to penetrate that defense. For a fixed number of offensive missiles, total warhead power (megatonnage) decreases as penetration aids are added to each reentry vehicle.\footnote{Because warhead yield varies directly with weight, and because, for a given range, individual ICBMs are limited to a maximum payload weight, any addition in non-warhead payload weight necessitates a corresponding reduction in warhead weight and yield.} Failure to take the precaution of adding such pen-aids could result in disastrous failure of the attacker's offense, thus a substantial reduction in payload arriving on target. Thus, whether or not the attacker adds pen-aids to his force, the amount of warhead payload arriving on target is reduced.\footnote{Interview J, and Jack Raymond, "Anti-ICBM Missile Faces New Delay," \textit{New York Times}, June 14, 1964.} Whether by actual ABM attrition or by "virtual attrition" resulting from shifts in payload allocation.

As the Defense Department prepared its recommendations for the FY65 budget in late 1963, the early findings of the Damage-Limiting and Threat Analysis studies provided Secretary McNamara with new perspectives on both the ABM issue and strategic nuclear policy. The studies had indicated a revised framework through which to view strategic defensive systems, and in doing so had reinforced the position taken previously by the administration regarding active and passive defenses, i.e., the view that fallout shelters were a more effective means of population defense than was an ABM, and should be procured prior to taking any action to deploy an active missile defense.\footnote{} There were other factors operating against the possibility of any
NIKE-X deployment decision in late 1963, the strongest of which was the status of the development programs for phased array radar and the SPRINT interceptor.

While the desire to wait for NIKE-X development appears to have been the most important determinant of the administration's decision to forego any ABM production funding in its FY65 budget, the basic attitudes of Secretary McNamara also influenced the character of the strategic forces section of the defense budget. A number of factors, including the Defense Secretary's belief that the strategic offensive forces of the United States enjoyed an overwhelming superiority over potential adversaries and his evolving perceptions regarding the desirability of tempering expensive arms competition with the Soviets, led McNamara to the belief that American strategic forces in existence or already programmed for procurement in the next five years (FY65 through FY69) were adequate to deter a Russian nuclear attack over that period.¹⁵

That the Secretary of Defense was impressed by the damage limitation idea was therefore not illogical in light of these factors. If America's primary objective for its strategic forces, deterrence of enemy attack, could be fulfilled by a force structure smaller than the current U.S. capability, then the damage-limitation objective provided a specific rationale—as did the counterforce theory—for the existence

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¹⁵See Kaufmann, The McNamara Strategy, p. 282. For a concise statement of McNamara's feelings regarding the strategic arms race, see his 1963 Posture Statement, p. 27.
of the rest of that current force. Further, the two 1963 studies argued that any future efforts at increasing damage-limiting capabilities had to begin with investment in shelter programs. Not only did McNamara gain valuable support for a high-priority administration program, but he served notice to the Congress that they would have to accept the bitter pill of major shelter funding prior to attaining DOD backing for the more popular active defenses.

In light of the status of NIKE-X technology, high system cost estimates, and OSD's ongoing process of strategic reevaluation, it was not surprising that the Army's perennial request for ABM pre-production funding was again rejected by the administration. As is the prerogative of the Chiefs of Staff, General Earle G. Wheeler took the Army's case for NIKE-X production directly to the President in early November, 1963, appealing Secretary McNamara's refusal to fund production preparations. It was the Army's position that such funding should be approved so that deployment could proceed at the most rapid rate practicable. Even though Wheeler appeared to accept OSD's position that NIKE-X system feasibility could not be demonstrated before late 1964, the General felt that the preproduction work should be initiated even prior to the actual deployment go-ahead.

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17 Ibid. To this author's knowledge, unclassified information as to the exact size and nature of the original Army request is not publicly available. While such information is often provided in Congressional testimony, all such references for the FY65 Army program are deleted from the public record. It is evident from General Wheeler's statement, however, that such a request was made by the Army and rejected by OSD in late 1963.
In many respects, the administration's decision in late 1963 to forego any support of deployment-related ABM funding mirrored similar policies in previous years. High costs, doubtful system capability to enhance U.S. strategic posture, and a DOD desire to perform more extensive program development had been persistent issues in U.S. ABM policy for some time. On the other hand, the missile defense issue in 1963 had assumed a new perspective, one which could potentially overcome these very objections which previously had been so central. The damage-limiting studies had utilized certain scenarios in which the active defenses gained in stature as strategic systems, and NIKE-ZEUS technology promised a more effective (when compared to ZEUS) system per dollar spent. Although SPRINT and MAR developments were a few months away from demonstrating system feasibility, there was general DDR&E and Army agreement that these components would achieve anticipated performance standards.\(^{18}\)

While ABM deployment remained open to serious questions concerning costs and effectiveness of such defenses, the kinds of categorical technical objections voiced with regard to NIKE-ZEUS were generally overcome by the NIKE-X system's improvements. U.S. strategic philosophy—assumptions about the nature of nuclear war and corresponding priorities for alternative weapons—replaced the technological issue as the central factor in the missile defense debate within the Defense Department. The Congress was therefore to receive a much different kind of administration presentation on ABM policy, a presentation which dealt with the very foundations of American national security policy.

\(^{18}\)This consensus has been documented through interviews with many of the scientists and engineers involved with these decisions in 1963.
THE FY65 DEFENSE BUDGET: McNAMARA'S VIEW OF ABM AND DAMAGE LIMITATION

Secretary McNamara's annual Posture Statement to the Congressional Armed Services Committees in January of 1964 reflected much of the impact of the changes in strategic thinking brought by the studies of the previous year. In his discussion of strategic force structure design, the Secretary emphasized the relationship between the size and character of those forces and the basic strategy which they were designed to implement. The debate in 1963 concerning such concepts as damage limitation, counterforce, and deterrence left its mark on McNamara:

The wide differences in perspective that this discussion has revealed would seem to indicate that we have failed to convey, at least to certain important sections of the American public, the basic fundamentals of the strategic problem confronting our Nation in this nuclear age.19

The Secretary thus began a review of alternative strategic theories, ranging from concepts requiring only small retaliatory forces to those necessitating much larger force levels than those existing at the time. Current United States policy, falling somewhere between these extremes, was described in the following terms:

To serve as a maximum deterrent to nuclear war, our Strategic Retaliatory Forces must be visibly capable of fully destroying the Soviet society under all conditions of retaliation. In addition, in the event that such a war is forced upon us, they should have the power to limit the destruction of our own cities and population to the maximum extent practicable.20 (emphasis mine)

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20 Ibid., pp. 29-30.
McNamara went on to place the concept of damage limitation in the context of expected war scenarios. Given the nature of current Soviet offensive forces, that nation could not launch all of their missiles and bombers at once, nor could they provide high degrees of protection for those forces remaining on the ground. Damage limiting through U.S. counterforce second strike targeting was therefore possible, and America maintained the necessary forces to conduct such a campaign. However, the ability of the Soviets to direct a major portion of their first strike onto U.S. cities, plus Russian capability to develop an increasingly survivable residual force (hardened ICBMs, submarine-based missiles, etc.), meant that the counterforce approach to damage limitation could be expected to become increasingly difficult in the future.

The Secretary was careful to emphasize that, even for very large levels of expenditure for defensive systems, fatalities would still run into tens of millions. No matter what force level the United States might practicably build, and even under the most favorable circumstances to the U.S., a nuclear exchange between the U.S. and the Soviet Union would do enormous damage to both sides. Reduction of U.S. damage was desirable, but it should be implemented only after sufficient resources had been allocated to forces able to deter attack. It was the threat of assured destruction delivered by secure and effective offensive forces which was seen to provide such a deterrent. Within

21Ibid., p. 30. The offensive force necessary for such a posture was "considerably larger than that which might be needed simply to destroy Soviet cities."

22Ibid., p. 31.
the resource constraints imposed by this ranking of values and by the high costs of active defense systems, McNamara formulated a statement of current policy:

A "damage-limiting" strategy appears to be the most practical effective course for us to follow. Such a strategy requires a force considerably larger than would be needed for a limited "cities only" strategy. While there are still some differences of judgment on just how large such a force should be, there is general agreement that it should be large enough to ensure the destruction, singly or in combination, of the Soviet Union, Communist China, and the Communist satellites as national societies, under the worst possible circumstances of war outbreak that can reasonably be postulated, and, in addition, to destroy their warmaking capability so as to limit, to the extent practicable, damage to this country and to our Allies. 23

While the emphasis on damage limitation may have led ABM supporters to expect a greater DOD commitment to defensive systems in FY65, such a policy did not evolve at this time. The Damage-Limiting studies had indicated that this particular strategic objective could be substantially fulfilled through counterforce utilization of offensive forces already programmed for the U.S. inventory. McNamara underscored this view as he reviewed the conclusions of the studies' scenarios:

In every pertinent case we found that forces in excess of those needed simply to destroy Soviet cities would significantly reduce damage to the United States and Western Europe. And the extent to which damage to ourselves can be reduced depends importantly on the size and character of our own forces, particularly the surface-to-surface missiles such as MINUTEMAN that can reach their targets quickly. 24

23 Ibid., pp. 31-32.
24 Ibid., p. 34.
In setting the stage for his discussion of defensive systems, the Secretary had related damage limitation to the planned force structure in such a manner that ABM procurement in fulfillment of such an objective was left as a future policy choice. Although long-term improvements in the survivability of Soviet offensive forces implied that active defenses would come to compare more favorably to counterforce targeting as damage-limiting techniques, available estimates indicated that currently programmed offensive forces could fulfill that role through the five year planning cycle currently being considered.

After outlining a series of recommended improvements in U.S. aircraft warning and defense, McNamara indicated that such defenses were an inseparable part of a wider, interrelated series of programs:

> There would be little point in further improving our defense against manned bombers unless we concomitantly improve our defenses against the ICBM and submarine-launched missile threat, including the defense of our population against fallout. The Continental Air and Missile Defense Forces Program which we are proposing for the fiscal year 1965-69 period, therefore, must be considered an interim program—pending fundamental decisions on the NIKE-X and on Civil Defense.  

The concept of a damage-limiting "package," implied here and later made explicit by DOD, would have marked impact on the character of the political aspects of the ABM debate in subsequent budget cycles.

The Posture Statement reviewed in some detail the goals, current status, and future expectations associated with the Army's development of NIKE-X. The text revealed a greater DOD optimism than had previously existed regarding the ultimate feasibility of missile defense, an

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25 Ibid., p. 45.
optimism based upon the assessments of Dr. Brown and his staff as to the capabilities inherent in the system's new technologies. McNamara warned, however, that technological success was not in itself a sufficient grounds for ABM deployment. The Secretary's subsequent discussion drew heavily upon the findings of the Damage-Limiting and Threat Analysis studies.

Central to OSD's doubts regarding NIKE-X was the system's questionable ability to operate at a level of effectiveness which would justify the high costs involved with deployment. In a major upward revision of the FY64 cost estimates, the posture statement fixed the price of one particular NIKE-X configuration at $16 billion initially, plus annual operating costs of a "very substantial" nature. At this level of expenditure, "such a NIKE-X program would probably be relatively effective against small to moderate missile attacks providing other appropriate measures...were also taken." The Secretary then presented three of the key observations of the 1963 studies, and none of these arguments advanced the case of ABM proponents.

Although he did not indicate the kinds of scenarios involved nor the exact quantitative levels to which he referred, McNamara noted that even the $16 billion ABM could not prevent fatalities numbering "several tens of millions." Without specifying the general level of damage involved (remember that the studies indicated that the cost ratios varied

26 Ibid., p. 52. Again, cost figures and deployment configurations were highly sensitive to the kinds of scenarios anticipated. The Army had previously contemplated smaller NIKE-X deployments than McNamara's $16 billion system, but for OSD, these smaller levels of ABM defense simply did not represent interesting additions to the damage-limiting forces.
27 Ibid.
28 Ibid.
over such levels), he argued that an enemy could improve its offense so as to overcome such an ABM, and could probably do so for only a fraction of the cost to the U.S. of offsetting this countermove with additional ABM measures. The Secretary saved his most potent argument for last: One should not procure an ABM without first buying an adequate civil defense system. The "upwind tactic" made shelters a prerequisite to systems like ABM: "For this reason, the very austere civil defense program recommended by the President...should be given priority over procurement and deployment of any major additions to the active defenses."29

Concluding his presentation, McNamara reiterated the "package" implications of continental defense. In addition to the improved bomber defense, fallout shelters, and ASW mentioned earlier, he raised the spector of yet another issue which represented both a part of a potential damage-limiting package and a possible reason for opposing terminal ABM systems. For the Secretary, the uncertainties generated by the fact that SPRINT interceptions took place at low altitude led to a potential requirement for a controversial and expensive type of civil defense, blast shelters. He implied that NIKE-X system effectiveness could hinge upon a capability to protect nearby population from blast and thermal radiation, populations endangered by the proximity of nuclear detonations both from enemy RVs triggered just above the SPRINT intercept height and from the ABM warheads themselves.30

29Ibid., p. 53
30Ibid.
THE CONGRESSIONAL BUDGET HEARINGS: A LULL IN THE ABM DEBATE

In previous budgetary cycles, Defense Department refusal to fund the Army's recommended ABM deployment had often fostered heated exchanges between DOD officials and missile defense advocates in the Congress. ABM supporters on the various committees dealing with military affairs usually succeeded too in eliciting Army and JCS testimony favorable to these legislators' desires to gain immediate deployment decisions, and the debate had generally pitted DOD's technical objections versus ABM advocates' strategic arguments for such systems. However, Congressional discussions of ABM policy in the FY65 budget hearings were characterized--with a few notable but minor exceptions--by changes in the kinds of arguments voiced on all sides. It was in these discussions that the full significance of the major strategic and technical changes which transpired in 1963 became evident. The stage had been set for a new kind of debate, and while subsequent years would find the ABM issue become a more prominent political issue, the basic arguments would remain essentially the same from this time on.

The evaluation of and rationale behind the administration's strategic view of ABM systems in early 1964 has already been discussed. The potential ramifications of the greater emphasis upon damage limitation through the use of a large package of defensive systems were important, but appeared to apply only in a long-term sense, given OSD's assessment that the current five-year budget plan already contained (without adding ABM systems) a "significant" damage-limiting capability. Perhaps more important for the current debate was the change in attitude by the civilian defense scientists regarding the ultimate feasibility of ABM defenses. While the administration was quick to emphasize that certain NIKE-X components had yet to be proven, the system as a whole was viewed as a good one.
Throughout the period of NIKE-ZEUS development, Defense Department technical experts had argued that the United States would be better off if it waited for the next generation of ABM components. Although such a position could also have been taken in opposition to NIKE-X, administration testimony took a different view. DDR&E director Harold Brown told a House subcommittee that NIKE-X:

...appears to be the best active ABM system, from the point of view of cost-effectiveness, that we will be able to achieve over the next 10 years. We may never have one better, although conceivably we will. I do not think a decision to deploy NIKE-X can be made on the basis that something better will be coming along. 31

Brown then testified that any deployment decision should be made on the following basis: Understanding that there is no absolute defense, is the nation willing to make the resource commitment associated with active missile defenses given the kinds of reductions in damage and fatalities which such systems could provide? Further, one's estimate of the likelihood of nuclear war should enter this assessment. 32

Just as noteworthy as DDR&E's more optimistic view of NIKE-X technology was the Army's testimony on the strategic issues attendant to ABM deployment. In earlier years, Army officials had indicated, usually in response to probing by legislators sympathetic to their deployment aims, the basic disagreements between OSD and Department of the Army assessments of the rationales associated with ABM funding. After initial testimony supporting the rulings of their DOD superiors,
Army officials had provided the Congress with that service's feelings on issues related to missile defenses. Given this historical trend, the Army testimony on two key sub-issues of the ABM problem in 1964 is quite interesting.

The foremost question underlying the entire ABM debate was of course the issue of deployment versus no deployment. In earlier years, the Army had been forced to counter administration statements arguing that the ZEUS should never be deployed. The 1958-63 budget debates therefore found the Army voicing reasons why ABM deployment was in their view a matter of great strategic urgency. The Defense Department indications that NIKE-X procurement could be seriously considered during FY65 created a different problem for the Army. Forced in the earlier debates to assume an advocacy of NIKE-ZEUS which was of equivalent intensity to DOD opposition, that service had had little to lose by challenging administration rationales for non-deployment. However, the argument put forth by Secretary McNamara in 1964 created a much more delicate situation.

If the Army truly accepted the idea of waiting for a number of months before seriously addressing the deployment issue, ABM advocates could perhaps expect a greater degree of support (or at least a lesser degree of opposition) from the Defense Department. To repeat the earlier practice of urging immediate deployment could act to destroy any such support. For the first time, the Army chose not to challenge publicly OSD's deferral of the decision. Even under specific questioning as to JCS disagreements with Presidential program decisions, Army Chief of Staff Earle Wheeler gave no indication that he had actively
sought immediate funding for NIKE-X production. In relating his discussions with the late President Kennedy on the matter, Wheeler noted that he felt strongly that the upcoming decision should be made in favor of deployment, but he implied that he too accepted the rationale for the deferral.\footnote{Ibid., Part 4, p. 600.}

A detailed discussion of the NIKE-X program between House DOD Appropriations Subcommittee Chairman George Mahon and other Army officials \textit{reinforced} the impression that the service had no serious objections to OSD's timetable for deployment decisions.\footnote{Ibid., Part 5, pp. 183-189.} In similar testimony before the House Armed Services Committee, two of these same officials, recently appointed Assistant Secretary of the Army for R&D Willis Hawkins and Chief of R&D General William W. Dick, indicated that any decision to deploy was a matter of national policy, not just Army opinion, and implied again that the Army agreed with the necessity to defer such a decision until later in the year.\footnote{Hearings on Military Posture and H.R. 9637, Committee on Armed Services, House of Representatives, 88th Cong., 2nd Sess., January-February, 1964, pp. 7654 (Hawkins), 7698-99 (Dick).}

The second potential point of contention between proponents and opponents of NIKE-X was the fallout shelter issue. It was apparent to most participants in the debate that the "buy shelters first" argument confronted the potentially potent political arguments in favor of ABM deployment (the ABM "gap" idea, etc.) with an even more powerful counter-argument deriving its strength from the strong Congressional and public aversion to large-scale shelter programs. In view of this
situation, one might have expected the Army, after paying the usual amount of traditional deference to OSD policy, to have opposed the insertion of shelters as a prerequisite to active missile defense.

In fact, however, Army officials backed the conclusions of the Damage-Limiting and Threat Analysis Studies concerning the fallout shelter issue. Under probing questioning from Congressmen Mahon and Ford, both Secretary Hawkins and General Wheeler indicated that they viewed the shelter argument as sound.\textsuperscript{36} Did such a position imply political returns for the Army which were essentially negative? After all, the problems associated with funding shelter programs were obvious. But while support of the damage-limiting package concept meant problems so far as the shelter issue was concerned, there were certain potential political gains to be realized. There were Navy and Air Force programs in the package too, and emphasis upon the interrelationship between all of the defensive systems could insure unanimous JCS backing for NIKE-X, along with the other damage-limiting programs. In addition to the stigma associated with rejecting the conclusions of their own service's analyses, then, Army officials did have some positive impetus to back the shelter argument.

The final aspect of change in the FY65 budget hearings concerned the legislators themselves. Unlike the experience in previous years, the Congressional debate in early 1964 did not include the issue of comparative U.S. and Soviet ABM capabilities. There were a few brief questions interspersed throughout the testimony which reflected the strategic and technical legacies of the test ban debate, but it was a pair of new issues which commanded the major portion of legislative

\textsuperscript{36}DOD Appropriations for 1965 (House), Part 4, p. 600 (Wheeler); and Part 5, p. 187 (Hawkins).
inquiries to the various witnesses. The first of these was basically a technical matter and concerned the physical implications of the reduced (compared to the ZEUS) intercept altitude which characterized the SPRINT. Apparently worried by the possible implications of Secretary McNamara's earlier comment about blast shelters, the Congressmen sought more information on the issue of NIKE-X-related problems in the attack environment during nuclear exchanges.

Of primary concern to some committee members was the possibility that the SPRINT warheads themselves would cause serious radiation damage to the population below even as the interceptors successfully destroyed enemy RVs. In response to questions in two different hearings, DDR&E's Harold Brown and Army weapons expert Lt. Colonel D. L. Vinson explained the nature of fallout.\textsuperscript{37} The type of fallout which represents a serious military problem is generated when the fireball of a nuclear warhead either touches or almost touches the earth's surface. Unless significant amounts of surface particles are churned up into the explosion's mushroom cloud, irradiated, and then fall back to earth, local fallout under an atmospheric blast would be negligible. Residual fallout resulting from the return to earth of radioactive particles from the warhead itself occurs, but it does not endanger persons in the combat area.\textsuperscript{38}


\textsuperscript{38}The size of the SPRINT warhead (approximately 10 kilotons) was such that, for intercept heights above 10,000 feet, fallout and blast damage to the area would be negligible. See the AEC Handbook (1962 edition).
More serious nuclear environment problems could be caused by fallout generated by enemy ground bursts upwind of defended cities. Such circumstances could evolve either (or both) as a result of conscious use of the upwind tactic as an anti-personnel attack device or through counterforce engagements involving hardened targets. Even when conducted with serious city-avoidance targeting guidelines, counterforce exchanges necessitated high levels of fallout when underground targets (ICBMs, stockpiles, control centers) were involved. Thus the Congress, historically hostile to large shelter programs, found that issue tied closely to the ABM deployment question. Strong legislative supporters of ABM, bothered by the implications of tying the two issues together, thus made an effort to resurrect the NIKE-ZEUS.

Citing Army briefings which had argued that the ZEUS presented no fallout problems equivalent to those associated with NIKE-X, Congressman Melvin Laird asked McNamara why the former system was therefore not better in this respect.\(^{39}\) In addition to this fallout issue and to the feeling that ABM should be deployed immediately, another thought prompted certain of the legislators to argue again for NIKE-ZEUS. Over $1.38 billion had been invested in that system, and there was a feeling that this money had somehow been wasted. In response to questioning on this matter from Senate ZEUS supporters Russell, Thurmond, and Saltonstall, Army officials were obliged to repeat the very technical arguments (vulnerability to decoys, limited rate of fire, etc.) against their first generation ABM that their service had sought to deemphasize

\(^{39}\) DOD Appropriations for 1965 (House), Part 4, p. 350.
in earlier years. 40

The Congressional foes of the administration's ABM policy had again questioned the utility of postponing deployment, but the debate had a passive, half-hearted tone. In examining the then current political climate, there were factors which could yield alternative interpretations regarding the lack of intensity of these exchanges. That it was an election year suggested that partisan lines might be drawn on NIKE-X, and a strong Republican core in the Senate (Thurmond, Salt- onstall, and the eventual Presidential candidate, Barry Goldwater) had already challenged McNamara's actions on the issue. A much more intangible factor which perhaps operated in the other direction, to quiet such debate, was the lingering cloud of President Kennedy's death. This gloom, plus the transition to a new President, appears to have affected the atmosphere of government in the early months of 1964.

THE STRATEGIC ENVIRONMENT: NEW THREATS AND NEW RESPONSES

Although strategic weapons policy represented an important part of Senator Goldwater's campaign challenges of Johnson administration defense efforts, ABM was mentioned only briefly by the candidates. Just as in 1960, missile defense failed to emerge as an election issue, and the Arizona Senator's program recommendations had an Air Force flavor. Bombers, interceptor aircraft, and offensive missile reliability were

40 DOD Appropriations for 1965 (Senate), Part I, pp. 866-880.
the major strategic forces issues voiced by the Republicans. \(^{41}\) 1964 saw important technology advancements in NIKE-X components too, especially in the area of radar development. Beginning June 15, the prototype multiple phased array radar (MAR), the central radar in the NIKE-X complex, became operational at the Army's White Sands test facility. Throughout the following months, this system tracked dozens of test vehicles fired down the White Sands Missile Range. \(^{42}\) In September, the Defense Department announced the successful development of over-the-horizon (OTH) radar, an extremely long range system, which, because of its ability to "bend" its signal beam around certain layers of the ionosphere, could detect enemy missile launches much earlier than even the BMEWS system. \(^{43}\)

Even as these two radars came into being, the Army advanced a theory which, if feasible, could have improved the decoy discrimination capabilities of ABM systems. At the time, effective discrimination depended upon the ability to observe major retardation in velocity or, better yet, physical destruction of lighter unshielded objects as

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\(^{41}\) These campaign characteristics were not unexpected, as Goldwater, a Reserve Air Force General and a pilot, favored these weapons maintained by that service, and preferred the manned vehicles within that group. For a review of the defense questions debated in the campaign, see Hanson W. Baldwin's "The Weapons Debate," and "Three Defensive Issues," *New York Times*, October 10 and 12, 1964.


they entered increasingly dense portions of the atmosphere. For all but the lightest of decoys, this technique required that the incoming objects pass through comparatively low altitudes, thus reducing the response time available to the defender's ABM system. Based upon numerous Atlantic and Pacific Range test shots, the Army postulated a technique which claimed to allow discrimination at a much higher altitude.\footnote{44}

At some point in the outer reaches of the atmosphere, each reentering object "flares" on the radar screen, i.e., it instantaneously changes from a small, faint radar image to a brighter and larger "blip." Army ballistics experts felt that by correlating the velocity of each object with the altitude at which it "flared" on the radar, they could accurately identify the approximate weight of the reentering bodies. If feasible, such a technique could revive the longer range ZEUS and allow interceptions to take place at much higher altitudes. Unfortunately for ABM advocates, the conclusions were adjudged to be unreliable. DDR&E officials warned that the Army's data set did not include a number of types of penaids and argued that the theory could allow discrimination only if the objects involved differed in weight by at least a factor of ten.\footnote{45} The United States had to continue to rely on atmospheric decoy sorting and SPRINT-type intercept techniques for its anti-missile defenses.

\footnote{44}{Interview J.}

\footnote{45}{The Army claimed a factor of 2-4, which would have allowed discrimination between warheads and heavy decoys, while the 10 factor would not. \textit{Ibid.} For a partial public leak of this information at the time of the debate over the theory's validity, see Hanson W. Baldwin's \"Missile Interception,\" \textit{New York Times}, July 24, 1964.}
As the Johnson administration studied the potential utility and ramifications of a NIKE-X deployment in FY65, a number of factors emerged to dominate defense officials' calculations regarding ABM systems. While the technical advancement realized in 1964 did not go unnoticed, it was the strategic environment which yielded the most significant modifications of the ABM issue in that year. Although scenarios involving accidental missile launches had been examined in the missile defense debate in previous years, the central contingencies commanding the attention of DOD and Army analysts remained those involving large-scale Soviet attacks. Beginning in early 1964, however, OSD broadened its view of potential missile threats to the United States, introducing perceptions of certain new types of threats.

In January of 1964, OSD's Office of Systems Analysis negotiated a study contract with Douglas Aircraft and Raytheon Corporation calling for analysis of "small defense" systems. The two companies were to examine scenarios involving small attacks (accidental launches, tightly controlled Soviet exchanges, and attacks from nations other than the Soviet Union) and suggest alternative ABM deployment configurations capable of defeating such less-than-massive assaults. Analysts at Douglas, realizing that their company's NIKE-ZEUS interceptor was not to be used extensively in contemplated NIKE-X configurations, had been thinking about both a longer-range ZEUS as a major NIKE-X component and the possibility of small deployments of ZEUS-type ABM systems as counters to unsophisticated threats.46

46Interview J. The study's formal title was "Characteristics of Anti-Ballistic Missile Systems Optimized for Defense Against Small Attacks."
The Douglas "small defense" study postulated a number of inexpensive ($1 to 5 billion) ABM configurations, some of which utilized small radars originally designed for anti-aircraft defense. Not only NIKE-ZEUS and SPRINT, but also NIKE-HERCULES, HAWK, and TALOS anti-aircraft missiles were suggested for use as interceptors. By suggesting the potential of defending against small ICBM threats with small ABM systems, the study raised three important issues. First, the possibility of missile attack from a nation other than the U.S.S.R. was emphasized. Second, it was argued that a small and unsophisticated ABM, while ineffective against heavy or complex attacks, could provide useful defense against correspondingly small and unsophisticated ICBM threats. Third, in presenting plans for a "thin" defense with "building block" components, the study revived the pre-NIKE-X ideas of area defense and flexibility of deployment configurations.\(^{47}\)

Douglas contemplated development of an extended-range ZEUS capable of providing true area defense against unsophisticated ICBMs. The small defense study suggested modification of the currently planned Missile Site Radars (MSRs) so as to make these small, battery-level phased-array radars independent of the larger MAR units. Such a development would allow deployment of autonomous area-defense batteries in whatever sequence and concentration desired, and would mean that even initial "thin" ABM systems using only a few batteries of long-range interceptors had the potential of stopping small attacks or accidents. This line of thinking provided the conceptual basis for later U.S. development of the SENTINEL system, a thin ABM which basically

\(^{47}\)Ibid.
followed the design suggestions of the small defense study.

Prior to the Douglas-Raytheon study, U.S. defense officials had not generally given much weight to the idea of using less sophisticated ABM deployments to counter unsophisticated offensive threats. The process of arguing against Army requests for NIKE-ZEUS deployments had led to OSD emphasis upon the manner in which the offense could modify its RVs so as to penetrate primitive defenses. One consequence of this debate was that the argument tended to deemphasize current offensive and defensive sophistication and deal in terms of future systems. At the same time that the Defense Department was studying the "small defense" concepts, the U.S. intelligence community was engaged in a debate on ABM systems, a debate destined to reinforce the findings of the Douglas-Raytheon group.

Intelligence assessments of Soviet ABM capabilities had generally agreed that the Russians' Leningrad system was of a much more primitive nature than even the already-rejected NIKE-ZEUS. From this judgment was derived a conclusion of significance for U.S. weapons planners. Both the Central Intelligence Agency and the Defense Intelligence Agency made the following argument: Soviet ABMs are not as sophisticated as U.S. ABMs; DOD had not deployed U.S. ABMs because they will be ineffective against enemy missiles; and therefore, Soviet ABMs would not be effective against U.S. missiles. While this was the accepted conclusion for the great majority of the intelligence community, one small group voiced a minority opinion which caused a certain amount of re-evaluation within DOD.
The Joint Analysis Group of the CIA raised a question as to the logic of the ABM effectiveness conclusion cited above. These men noted that the argument about U.S. ABMs actually dealt not with the existing offensive and defensive weaponry, but with future systems. Thus, the conclusion about overpowering offensive sophistication in that case seemed sound enough. However, the point about Soviet ABMs had to be viewed in a different context. By early 1964, the U.S.S.R. had in place (although their degrees of operational capability were still at issue) not one, but two ABM systems. In addition to the so-called Leningrad system, reconnaissance indicated the presence of construction on a new set of missile defense sites ringing Moscow.\(^{48}\) Thus, assessments of the potential effectiveness of these admittedly unsophisticated Soviet defenses should depend not upon comparison to future U.S. offensive forces, but upon examination of current American penetration capabilities.

In surveying the U.S. offensive missile inventory of the time, the Joint Analysis Group was alarmed at what it saw: The current American land-based and submarine-based force, with one minor exception, was not equipped with decoys.\(^{49}\) Only the ATLAS E carried penaids, and this

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\(^{48}\) This information was leaked publicly in February. See Richard Fryklund, "U.S. Discovers New Moscow Missile Ring," Washington Star, February 18, 1964. Information in later years would credit the Moscow unit with a much higher potential performance capability than its predecessor near Leningrad. At this time, however, few analysts made any distinction in performance between the two units.

\(^{49}\) Current (January, 1964) U.S. forces included 126 ATLAS (D through F series), some 200-240 MINUTEMAN I, 12-18 POLARIS submarines, each carrying 16 POLARIS A-1 or A-2 missiles, and 108 TITAN missiles. None of these missiles (excluding the 36 ATLAS E's) were credited with high-confidence penetration ability against even ZEUS-type ABM systems. (See supra., p. 146) For a listing of U.S. forces of the period, see the 1963-64 and 1964-65 editions of the Institute for Strategic Studies' The Military Balance (London).
system--of which there were only 26 operational versions--was scheduled to be phased out of the inventory before the end of 1965. 50 The rest of the U.S. missile force was dependent upon speed and/or saturation targeting to defeat enemy defenses. The CIA analysts thus warned that perhaps the Soviets had achieved a strategic advantage through utilization of a primitive, yet less costly (compared to systems like NIKE-X) ABM deployment, a deployment which could continue to provide a useful level of missile defense so long as enemy (i.e., U.S.) ICBMs lacked sophisticated penetration aids. 51 Although the Joint Analysis Group's arguments never really achieved any widespread prominence outside DOD and the U.S. intelligence community, a significant point had been made. Lack of sophistication in ABM systems may still force an enemy to develop highly sophisticated offensive weapons, and primitive missile defenses, while vulnerable to such an offense, could conceivably perform quite well versus smaller and less advanced ICBM forces.

As OSD personnel turned in the summer of 1964 to the task of preparing program recommendations for the FY1966 budget, there were new considerations to be weighed in the formulation of future ABM policy. The small defenses study and the CIA debate had raised the dual issue of less-than-massive threats and correspondingly limited responses in strategic weaponry. Small attacks, either from the U.S.S.R. or from "Nth Countries" (other nuclear powers) such as Communist China, could conceivably be countered effectively by "thin" and relatively

51 Interview J.
unsophisticated (compared to NIKE-X) ABM systems. Also rising in importance within the debate was the "strategic instability" view, the belief that weapons like ABM would seriously upset the delicate East-West arms balance and lead to futile stages of a spiraling arms race. Questions of "thin" ABM systems, Nth Country threats, and problems of nuclear instability were all a part of the FY66 budget preparations concerning missile defense.

In preparing its annual input to the DOD Draft Presidential Memorandum (DPM) on strategic forces, OSD's Office of Systems Analysis suggested that the United States should seriously consider deployment of a thin ABM system. In light of the possibility that the U.S. might have to deal with small nuclear threats from nations other than the U.S.S.R., Systems Analysis went beyond the conventional "heavy" NIKE-X deployment as it viewed defensive options. The DPM draft suggested three possible ABM configurations: A heavy system corresponding to the $16 billion program discussed by McNamara earlier in 1964, a thin system designed as a foundation for later incremental additions leading to a heavy system (and useful in the meantime against nations like China), and a very thin system. This third alternative was viewed by Systems Analysis to be useful not only in the context postulated by the small defense study,


but also as a domestic political vehicle to deemphasize ABM deployments as large-scale defensive measures.\textsuperscript{54}

THE Nth COUNTRY HAS A NAME: CHINA ENTERS THE NUCLEAR CLUB

As the Defense Department formulated its FY66 budget recommendations for the President in the fall of 1964, the Army submitted a detailed program request for funding of an extensive missile defense system. As in the past, the stated objective was defense against the Soviet Union, and the recommended deployment entailed NIKE-X batteries able to defend 30-35\% of the population. In addition, the Army budget request included a large-scale fallout shelter program calling for an expenditure of over $137 million in FY66.\textsuperscript{55} For the FY66 budget, the Army's ABM package included almost three quarters of a billion dollars: Approximately $400 million for research and development on NIKE-X, some $200 million preproduction funding for that system, and the shelter plan noted above.\textsuperscript{56} If approved, the plan entailed gradually increasing annual expenditures for production, deployment, and operation, expenditures in the $2-3 billion range annually over some six years.

\textsuperscript{54} Interview J.


\textsuperscript{56} Beecher, ibid. See also the testimony of Army Assistant Secretary Willis Hawkins in the 1966 House DOD Appropriations Hearings (ibid.), p. 348. The actual size of the final deployment sought by the Army corresponded to the $16-17 billion system discussed by McNamara earlier in 1964.
As Secretary McNamara and his staff were studying the Army program request, an interesting sequence of events transpired, events which modified the strategic circumstances facing U.S. defense planners. On October 15, 1964, McNamara received and read the strategic forces DPM draft which emphasized the potential utility of small ABM deployments against third, or "Nth," countries, especially Communist China.57 On that same day, it was announced that Soviet Premier Khrushchev had been deposed. Before the Johnson administration had time to assess the impact of this change of leadership in the Kremlin, yet another occurrence revised the strategic environment. On October 16, the Chinese People's Republic detonated that nation's first atomic bomb. Although the device was a primitive one, it marked China's emergence as a nuclear power. The threat of Chinese missile attack was some years away, but the taking of the first step--development of an atomic device--was an omen of a potential future military threat.58

The idea of an ABM deployment designed specifically to counter first-generation Chinese ICBMs had many implications for the missile defense issue. Such a Chinese force could be expected to lack (initially, at least) sophisticated penetration devices, thus raising the possible effectiveness of U.S. ABM systems deployed against those missiles. Further, the anticipated Chinese force would consist, for a number of years at least, of a relatively small number of operational

57 Interview J.

missiles. An anti-Chinese ABM could therefore anticipate much less difficulty in the matter of saturation: A force of only 15-50 ICBMs limited an enemy as to the number of defended U.S. targets he could hope to defeat by virtue of numbers alone.

Finally, an anti-Chinese deployment might provide the political tactic which could allow an administration to resist pressures for a much more costly anti-Soviet missile defense. While Secretary McNamara could continue to argue the probable ineffectiveness of NIKE-X against the offensive capability of the U.S.S.R., the absence of any U.S. missile defense heightened the political significance of the issue. Construction of a limited ABM could conceivably quiet a number of legislators and other NIKE-X supporters for whom the issue was one of deployment (any deployment) versus lack of missile defense. What the anti-China rationale offered was a specific basis for drawing the expenditure line at a point far below that desired by the Army and its strong supporters in the Congress.

As the Johnson administration prepared its FY 1966 budget for presentation to the Congress, the ever-changing context of the ABM debate promised alterations on a number of fronts. As development of NIKE-X components moved closer to fruition DOD officials would be forced to concede the basic feasibility (at an admittedly uncertain level of effectiveness) of that ABM system. As for the strategic situation, the Soviet Union was apparently building a new ABM system itself, and the Chinese People's Republic had demonstrated that its scientists had
mastered the basic principles of atomic fission. Politically, the inclusion of ABM systems in a "Damage-Limiting" package containing programs of each of the services portended a more united military support for expenditures for defensive systems. The Army's inclusion of a shelter plan in its initial FY66 budget plan indicated that the service had chosen to push for a deployment decision on McNamara's terms, at least in the planning process, but this did not necessarily mean that OSD could anticipate anything like the Army's 1964 support of administration ABM policy in the upcoming hearings. With NIKE-X much more developed, with threats from two potential nuclear opponents, and with a more united military advocacy of missile defense, the administration moved into the 1965 chapter of the ABM debate.

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59 In the November 7, 1965, Moscow parade celebrating the anniversary of the Bolshevik Revolution, the Soviets displayed (although hidden in a transport cannister) a new ABM rocket. Codenamed "GALOSH," this NIKE-ZEUS-sized interceptor was thought by U.S. intelligence to be the basic rocket in the Russians' new Moscow ABM installation. See Adam Clymer, "Anti-Missile Paraded in Moscow; Malinovsky Raaps U.S.," Baltimore Sun, November 8, 1964.
CHAPTER VIII

LONG RANGE ABM SYSTEMS AND AREA DEFENSE

If there is anything "constant" about the nature of the ABM debate in the mid-1960's, it is the way in which new strategic and technological developments forced shifts in the context of the missile defense issue. In 1963 it was the evolution of NIKE-X technology, the strategic arguments attendant on the test ban treaty, and the initiation of the damage-limiting studies which served to reorient the ABM question. In 1964, DOD's continuing emphasis on damage limitation, plus the increasing likelihood of China's attainment of nuclear power status, further modified the arguments and perceptions of the debate's participants. Events in 1965 would yield additional changes: The dynamics of technology and world events again provided new problems and new potentials relevant to the strategic force capabilities and policies of the United States.

Secretary McNamara's view that any NIKE-X deployment decision should be deferred until the FY67 budget had been communicated to the President in December, 1964. Although the Joint Chiefs of Staff had unanimously recommended to the contrary, the White House concurred with OSD, and the Army's $200 million preproduction funding request was rejected.\(^1\)

The administration's FY66 funding request for ABM systems did include

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\(^1\)See Military Procurement Authorizations, Fiscal Year 1966, Hearings held jointly before the Armed Services Committee and the DOD Appropriations Subcommittee, U.S. Senate, 89th Cong., 1st Sess., February-March, 1965, p. 355.
some $400 million for R&D on the NIKE-X, plus $10 million for preliminary production engineering studies. The reasons underlying the administration's deferral of ABM production were indeed complex, and the Defense Department insured that the bases for this position were made readily available to the Congress and public. As he had done in 1964, Secretary McNamara included in his 1965 Posture Statement a detailed account of current DOD thinking on the missile defense question.

McNAMARA'S 1965 POSTURE STATEMENT: IMPLICATIONS FOR THE ABM DEBATE

In his introductory comments on strategic forces, McNamara described the manner in which offensive and defensive (both active and passive) systems were closely interrelated in U.S. defense policy, and indicated that OSD's force planning studies had therefore integrated all three components into a single analytic framework. He defined the two major objectives of this integrated force structure as being:

1. To deter a deliberate nuclear attack upon the United States and its allies by maintaining a clear and convincing capability to inflict unacceptable damage on an attacker, even were that attacker to strike first; and

2. In the event such a war should nevertheless occur, to limit damage to our population and industrial capacities.

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3Ibid., p. 37.
The Secretary titled the capability associated with the first objective "Assured Destruction," and that relevant to the second "Damage Limitation."  

McNamara had thus explicitly defined the kinds of goals and capabilities to which he had referred in his 1964 Congressional presentation. He further emphasized that of the two objectives, the first--the one most directly related to deterrence of enemy aggression--was by far the most important. Only after such resources had been committed so as to provide a high confidence Assured Destruction capability should expenditures be made in fulfillment of the Damage Limitation objective. 

After explaining that Damage-Limitation expenditures could not (under foreseeable technological circumstances) provide anything approaching perfect protection for U.S. cities, McNamara bared his image of U.S.-Soviet interaction concerning such objectives. He argued that both nations have the same general strategic objectives, which makes the U.S. Assured Destruction objective the Soviet's Damage Limiting problem, and America's Damage Limiting objective becomes the U.S.S.R.'s Assured Destruction problem. If Assured Destruction is the Soviets' number one priority, then any U.S. improvement in Damage Limiting capability implies a reaction by the enemy, a reaction necessary to regain prior levels of destruction capability. McNamara had placed the "strategic instability" argument squarely into U.S. strategic thinking: If, as he argued, the Soviets seek (as the U.S. does) to assure some unacceptable level of damage to potential adversaries, then a major defensive (damage  

Ibid., p. 38.
limiting) buildup by such an adversary would require the U.S.S.R. again to build up its own offensive (assured destruction) forces.\textsuperscript{5}

This argument concerning action and reaction did not refer specifically to ABM systems in the text of the Posture Statement, but the implication was clear: Large-scale damage limitation efforts (and NIKE-X was the major program in this "package" of options) would very likely be offset by an enemy bent upon maintaining its pre-ABM Assured Destruction capability. The Posture Statement further sought to reinforce this point by citing an argument previously used in OSD, the offense/defense cost ratio argument. McNamara observed that if the Soviets were to respond as anticipated to U.S. expenditures for strategic defense, they could do so at a cost which "would appear to be substantially less than the extra cost to (the U.S.)."\textsuperscript{6}

The cost ratio argument continued to be the source of some debate among defense officials. The Threat Analysis and Damage Limiting studies had indicated a one-to-one ratio at particular levels of strategic force expenditure, levels in the area just beyond the then current expenditures for such forces.\textsuperscript{7} Such an observation was used by NIKE-X

\begin{footnotesize}
\textsuperscript{5}Ibid., pp. 38-39. It is important to note that the Assured Destruction role may be fulfilled in part by the defensive as well as offensive systems; (for example, hardpoint ABM defenses of ICBM silos to insure survivability of the offensive missiles), and the Damage Limitation role may be partially fulfilled by offensive systems (through counterforce targeting) as well as defensive ones.

\textsuperscript{6}Ibid., p. 39.

\textsuperscript{7}See supra., p.233. It must be pointed out that the calculations from which these ratios were derived are crucially dependent upon the technical performance of the active defense systems like ABM. To the extent that NIKE-X performance was uncertain, the validity of the ratios was correspondingly questionable.
\end{footnotesize}
supporters to argue for ABM deployment on the grounds that the Soviets would have to match the U.S. dollar for dollar in order to return the former nation's assured destruction capability versus the United States to its pre-ABM level.\textsuperscript{8} Secretary McNamara's presentation to the Congress stressed the point that the offense continued to maintain the cost ratio advantage, even under the assumptions of the Army's Threat Analysis data, at levels of expenditure consonant with contemplated NIKE-X deployments. While the ratio might be one-to-one for the first two to three billion dollars spent beyond the then current strategic force budget, one had to look at the ratio in the $10-20 billion range, because it was that kind of funding for ABM which the Army had in mind.\textsuperscript{9}

\textsuperscript{8}ABM proponents had traditionally been faced with the fact that an enemy could build enough new offensive weapons to overcome NIKE-X for costs which were but a fraction of the cost to the U.S. of the ABM system itself. The possibility of a situation where the ratio went to one-to-one, where such an offensive response was just as expensive as the defensive expenditure, led certain defense analysts to argue that a new arms control situation now existed whereby nations could forego offensive expenditures and achieve equal effectiveness from their force structures by procuring ABM systems. As noted above, however, such an argument is heavily dependent upon the validity of the calculations which yielded the one-to-one ratio, and OSD officials understood that the Threat Analysis study's assumptions about NIKE-X effectiveness were highly optimistic in their estimates of the defense's ability to discriminate decoys and handle large-scale attacks. As a result, few experts outside the Army itself placed much credence in the argument that the defense had indeed become essentially equal in cost to the offense. One analyst who does believe that such cost ratios actually exist, and who makes such an argument in support of ballistic missile defense, is the Hudson Institute's Donald Brennen. See his "The Case for Missile Defense," Hudson Institute monograph 1117/2, February 20, 1969.

While the 1964 Posture Statement's references to the utility of a "Damage Limiting strategy" could be interpreted as indicators of a favorable OSD position on funding of strategic defensive systems, the 1965 statement left a much different impression. In the latter statement, four arguments were cited as constraints on U.S. implementation of any extensive damage limitation program. First, as noted above, the Assured Destruction capability commanded first priority, and Damage Limitation funding could come only after the former category had been adequately supported. Second, the wide variety of Assured Destruction methods available to an enemy required a defender to insure balance in any effort to limit damage. Although one might develop an effective defense against one type of offensive system, such a defense would by itself contribute little to the defensive role. For example, an area defended by a "good" anti-aircraft defense would remain seriously vulnerable to enemy missiles. The OSD conclusion: "A meaningful capability to limit the damage of a determined enemy attack, therefore, requires an integrated, balanced combination of strategic offensive forces, area defense forces, terminal defense forces and passive defenses."\(^{10}\)

The third constraint involved the concept of marginal utility. Because successive additional expenditures for Damage Limitation yielded smaller and smaller returns in terms of lives and industrial capacity saved, the value of extensive programs of this kind was questionable:

\(^{10}\) 1965 Posture Statement, p. 40. This was the "package" concept originally voiced by McNamara in 1963.
As additional (defensive) forces are added, the incremental gain in effectiveness diminished. When related to our other national needs, both military and non-military, this tendency for diminishing marginal returns sets a practical limit on how much we should spend for Damage Limiting programs.11

Even the seemingly valuable incremental gains were open to question, McNamara argued, because of the many uncertainties involved in assessing defense capabilities. The performance uncertainties associated both with basic design feasibility and ultimate combat operation—the very technological issues underlying the history of the ABM issue—made cost-effectiveness calculations involving such weapons highly questionable. Perhaps even more serious was the uncertainty derived from the strategic environment: What are the capabilities, intentions, and operational attack preferences of potential opponents? As earlier discussion in this study has indicated, assumptions concerning the sophistication of enemy ICBMs are crucial to the setting of expected performance levels for ABM systems. Further, the uncertainties regarding the nature of attack scenarios made damage calculations difficult, especially when a counterforce response by the U.S. was anticipated. It was evident that McNamara was becoming increasingly dubious concerning the weight which the United States should place on using strategic offensive forces to limit damage following an enemy first strike. For the Secretary, the scenario which allowed extensive counterforce targeting—the one in which an enemy delayed attacking U.S. cities for at least an hour after launching its first wave of attack—was "an unlikely contingency."12

11Ibid.
12Ibid., pp. 41, 46.
McNamara's position on Damage Limitation, and the weapons such as NIKE-X which were associated with such a capability, was a pessimistic one. High costs, serious uncertainties, the need for balance, and the general inability to approach "perfect" defense were his major arguments against making major resource commitments to strategic defenses. Given such assumptions regarding nuclear war strategy and technology, a multi-billion dollar ABM system was not considered to be a high-payoff investment. In elaborating upon his department's analyses of defensive systems, the Secretary expanded upon the administration's basic reasons for opposing NIKE-X production funding in FY1966. The primary argument evolving from various damage limitation studies was that a fallout shelter program provided a much higher degree of protection for initial expenditures over current capabilities than did an ABM system.

Using a scenario which assumed a mixed counterforce-countercity first strike by the Soviet Union, the Posture Statement listed expected U.S. fatalities for various levels of American investment in damage limiting systems. The analysis further indicated two sub-cases, one assuming no opportunity for U.S. damage limitation through counterforce, the other postulating sufficient delay in the enemy's urban attack to allow such U.S. targeting. In this analysis, an initial investment of $5 billion for a fallout shelter program reduced expected fatalities from 122-149 million (depending upon the timing of the urban attack) to 90-120 million. If the $5 billion was instead divided among active and passive defenses (presumably including NIKE-X), fatalities would be reduced by a lesser amount to perhaps 107-145 million.13

13 Ibid., see tables on pp. 47-48.
At initial funding levels, a shelter program was the most effective defensive device, much more so than active defenses. McNamara, illustrating the operation of the law of diminishing returns, noted from these data that, while the $5 billion investment for shelters reduced fatalities by some 30 million, an additional $20 billion active defenses expenditure (this closely approximated the then current Army NIKE-X recommendation) provided a somewhat less efficient reduction of an additional 40 million fatalities. 14

The Posture Statement's detailed (and lengthy--some 32 pages of text and tables in the unclassified version) discussion of strategic weapons and policy laid an impressive groundwork for Secretary McNamara's specific pronouncements on the NIKE-X deployment question. OSD had developed an elaborate analytically derived position, based upon the Damage Limitation objective, which opposed immediate expenditures on active defenses. Questions of enemy responses, prerequisite shelter expenditures, and technical uncertainty were all incorporated into the analyses of damage limitation alternatives, and these factors were apparent as McNamara explained his decision to defer any NIKE-X procurement decision:

Although the NIKE-X development is progressing satisfactorily, there are many technical problems still to be solved and I believe it is still premature to make any commitment to production and deployment at this time. Over and above the technical problems there are even greater uncertainties concerning the preferred concept of deployment, the relationship of the NIKE-X system to other elements of a balanced

14 Ibid., p. 50.
Damage Limiting effort, the timing of the attainment of an effective nation-wide fallout shelter system and the nature and effect of an opponent's possible reaction to our NIKE-X deployment.... (Although no production funding is to be provided in FY1966), We plan to reexamine the question of production and deployment of the NIKE-X system again next year. Considering the vast amount of development, test and evaluation work still to be accomplished, deferral of this decision to the FY1967 budget should not delay an initial operational capability by many months beyond what we could expect to achieve if we were to start production in FY1966.\(^5\)

As noted in Chapter Seven, the Army's original FY66 NIKE-X funding request had conceived of a defensive capability designed to counter the sophisticated and large Soviet ICBM force expected to exist in the early 1970's. While the Nth Country problem and the role of ABM systems in certain resultant scenarios had not been dealt with extensively by the Army's budget planners, OSD thinking had become increasingly cognizant of the "small threats" idea.\(^6\) The 1964 strategic forces DPM's comments on Communist China's potential nuclear capability (which reflected in turn the concepts advanced by the "small defense" studies in that same year) had its impact on Secretary McNamara.\(^7\)

There is also the possibility in the 1970's of a small nuclear attack on the United States by a nation possessing only a primitive nuclear force. Accordingly, we have undertaken a number of studies in this area. Our preliminary conclusion is that a small, balanced defense program could, indeed, significantly reduce fatalities from such an attack. However, the lead time for additional nations to develop and deploy an effective ballistic missile system capable of reaching the United States is greater than we require to deploy the defense.\(^8\)

\(^5\) Ibid., p. 63 (parentheses mine)
\(^6\) Interview R.
\(^7\) 1965 Posture Statement, p. 49. Note that this concept of balance required that, even for defense against small threats, equivalent monies must be allocated to aircraft defense, shelters, and ASW, as well as for ABM systems.
The concept of a limited NIKE-X deployment was seen by OSD as a potentially valuable one, but there was no need to make such a decision in FY66, given the system lead times involved.

STRATEGIC CHANGE AND TECHNOLOGICAL INNOVATION: THE AREA DEFENSE IDEA

Compared to previous years, the 1965 budgetary hearings found Congressional discussion of the ABM issue both limited and calm. While it is difficult to attribute reasons for this situation, two factors appeared to exercise some influence upon the Congress. Secretary McNamara's Posture Statement provided the legislators with a number of new perspectives on strategic policy, and indicated a series of arguments as to why deployment of NIKE-X should be deferred until a later time.

The fallout shelter issue and the general problems inherent in the damage limitation task both implied that the costs involved in missile defense were so great as to preclude such programs in the absence of a great and impending threat. The low end of the ABM cost range discussed in the various hearings was $15-16 billion, and this figure did not include elements such as shelters, ABM operating costs, or complementary aircraft defenses.¹⁸

In addition to the matter of high costs, the legislators were also forced to deal with the question of potential threats. In previous years, fears of Soviet ABM development had led to Congressional support for the

¹⁸These other costs had been estimated as follows: $5.2 billion for shelters ($3 billion of which would be federal funds), $1.5-2 billion annually to operate the NIKE-X system, and $3 billion for an improved bomber defense. See 1965 Posture Statement, pp. 47-48, and also James Trainor, "NIKE-X Fate Keyed to DOD Study," Missiles & Rockets, Vol. 14, May 18, 1964, pp. 14-15.
Army's ABM systems, but McNamara's detailed argument in the Posture Statement appears to have effectively allayed most of these fears in 1965. The Secretary's explanation of the manner in which the administration was maintaining a large Assured Destruction capability indicated OSD's specific intention of insuring an effective deterrent even in the face of potential Soviet missile defense programs.\textsuperscript{19} In addition to the Soviet threat, there was the potential nuclear capability of the Chinese. Proponents of NIKE-X had not dealt to any significant extent with the concept of an anti-Chinese ABM deployment, other than in the context of citing such a capability as a side benefit of anti-Soviet versions of the Army system.

The October, 1964, detonation of China's first nuclear device acted to dramatize the possibility of that nation's development of an ICBM capability. This led OSD analysts to generate ideas regarding ABM defenses versus such a threat, although the technological constraints of the NIKE-X system made such concepts look somewhat unattractive. Because NIKE-X batteries could defend only small points, and because an acceptable defense against even a small threat necessitated protection for a relatively large number of cities, an anti-Chinese system remained an expensive undertaking. Although there was little discussion of the point, McNamara did indicate to certain Congressional groups that such

\textsuperscript{19} 1965 Posture Statement, p. 45.
a "less-than-full" deployment was under consideration. 20

By April of 1965, with certain portions of the appropriations hearings still going on, a series of events took place which served to modify significantly the kinds of options open to the United States concerning ABM policy. Involved here was a complex relationship between technological capabilities, planning assumptions, and threat perceptions. In analyzing NIKE-X prior to 1965, U.S. officials (both technical and administrative) involved with ABM policy had worked under an interlocking set of assumptions concerning future ABM capabilities. Future missile defense assessments were to undergo a major change as, domino-like, these assumptions fell and in turn led to new ideas.

The concept of a long-range area defense against ICBMs had been present since the early days of the Air Force WIZARD project. There were two major constraints which had thus far prevented the development of such a system, and there was general technical consensus on these factors. First, limited range capabilities of ABM radars and interceptors effectively prevented interception at great distances. Second, even if these range problems were to be solved—and NIKE-ZEUS made major gains in both areas between 1957 and 1964—the discrimination problem remained a fatal difficulty. Long range systems, even those with great accuracy,

20 Department of Defense Appropriations for 1966, Subcommittee on DOD Appropriations, U.S. House of Representatives, 89th Cong., 1st Sess., Part 3, March, 1965, p. 355. What was involved here was a "thinned" version of the Army's preferred NIKE-X configurations, one which cut costs by reducing the number of costly MARs and allowing the various MSRs to function as autonomous battery command units performing all radar functions for the unit's SPRINT force. Such a concept had been advanced both by the Douglas "small defense" study and by DDR&E engineers. Interview B.
were doomed to shoot at each and every object, because the vacuum of space provided few solid clues as to the identity of decoys versus warheads.

Beginning in 1964, a number of organizations and technical groups engaged in a study process which was to modify drastically the relationship of these constraints to ABM systems design. It is impossible to attribute any solid causal chain or ranking of contributions in examining the sources of this modification, but each of the following circumstances appears relevant. The discrediting of NIKE-ZEUS by defense scientists had not eliminated Army support for that particular interceptor missile. Even granting the superiority of SPRINT, Army officials argued that a comprehensive ABM deployment should include a number of ZEUS rockets. The service was supported in this matter by the NIKE-X prime contractor, Bell Laboratories, and by the corporation which produced NIKE-ZEUS, Douglas Aircraft.²¹

The idea of retaining the long-range interceptor in any ABM deployment was further reinforced by the kind of thinking associated with the "small defense" analysis and the potential Chinese ICBM threat. The most powerful criticism of NIKE-ZEUS throughout its existence had been based upon the fact that its intercept took place at an altitude which was too great to allow the system to utilize the atmosphere to

²¹Interview B. Although the blackout problem continued to exist regardless of the range of ABM systems, long-range area systems were thought to provide a technique for overcoming (at least partially) this difficulty. Such an area system's radars could "look around" blacked-out areas, just as SPRINT radars hopefully could. In addition, overlapping coverage by adjacent batteries was made easier by the extended range of area defenses.
discriminate among various warheads and decoys. However, if one could argue the presence of enemy ICBM threats which were as yet unsophisticated in penaid development, then ZEUS provided a level of performance which was much more interesting. Douglas Aircraft made this position explicit in the 1964 "small defense" study, and numerous Army and DOD officials, concerned with the Chinese threat, supported the idea of retaining the long-range interceptor in ABM deployment plans.\textsuperscript{22}

While the NIKE-ZEUS/NIKE-X contract team of Bell Labs and Douglas pushed the long-range ABM idea, DDR&E scientists too began to integrate a number of concepts and technological gains in support of ZEUS-type missile defense. The idea of extended-range interceptors operating beyond the earth's atmosphere received a major boost from another source besides the Army and its contractors, and it was this external impetus which perhaps did the most to spur DOD into development of exoatmospheric ABM systems. As U.S. intelligence gained more information on the Soviet MOSCOW ABM system, these analysts became increasingly convinced that the U.S.S.R. had shifted its missile defense philosophy to exoatmospheric systems.\textsuperscript{23}

Armed with this realization concerning Soviet efforts, DDR&E began to examine four basic observations concerning ABM technology. Taken individually, these ideas had few implications for innovative missile

\textsuperscript{22} Ibid., also Interview L.

\textsuperscript{23} Interview Q. The Soviet Union had publicly paraded their new (and apparently long-range) ABM rocket, codenamed GALOSH by U.S. intelligence, in November, 1964. The Leningrad system, which the Soviets had apparently deemphasized, was generally credited with a ZEUS-type range (100 miles), but the GALOSH's size led to estimates of ranges well in excess of this.
defense configurations, yet the combination of the four yielded a new concept in deployment potentials. First, predictions in the early 1960's regarding the ease with which an attacker could effectively foil an ABM with decoys appeared too optimistic. The problems associated with dispersing such decoys from an RV so as to confuse sophisticated (particularly phased array) radars were great. Further, this dispersal had to separate the various objects far enough so as to preclude multiple kills by large ABM warheads. Discrimination prior to atmospheric reentry was feasible unless an enemy made an extensive effort to confuse ABM radars with penaids, and even then, deception through decoys was not a high confidence penetration technique.

Closely related to this observation concerning penetration was the second major point, this time dealing with nuclear weapons effects. Above the atmosphere, large portions of the energy emitted by a nuclear blast take the form of X-rays. AEC scientists had designed warheads which maximized this X-ray effect, with the result that potential ABM kill radii above the atmosphere could be extended by thousands of feet.\(^\text{24}\) While the X-ray kill mechanism had been understood for some time, its implications had been deemphasized for two reasons. First, as discussed above, discrimination difficulties implied that even a far-reaching kill mechanism would be ineffective against well-dispersed decoys and warheads. The defender would still be forced to shoot at everything, thus making the ABM system vulnerable to saturation tactics quite rapidly.

Second, the offense's ability to shield RVs against ABM attack had frequently been assumed by DDR&E\textsuperscript{25} to be a relatively easy task. Moderate levels of such shielding (portions of which were necessary in any case to allow atmospheric reentry) appeared effective against blast and neutron kill mechanisms for all but the smallest intercept miss distances. However, the extremely high energy X-rays emitted by a well-designed ABM warhead were much more difficult to shield against, even for relatively large miss distances. As atomic scientists designed warheads with greater and greater X-ray emission characteristics, this kill mechanism became increasingly attractive.\textsuperscript{26}

The combination of efforts by DDR&E, the Army, and civilian contractors had succeeded in integrating a series of concepts resulting in the idea of exoatmospheric area ABM defense. Available technology was adequate to allow development of extended-range interceptor rockets—indeed, the NIKE-ZEUS vehicle itself provided the basic design from which to proceed. Work had gone on continuously to improve the range capabilities of the new phased array radars, and no major difficulties were anticipated in this area either. The realization that pened dispersion was a difficult technical feat and the availability of large-yield nuclear warheads

\textsuperscript{25}Interview Q.

\textsuperscript{26}Interview Q, Interview S. As early as mid-1963, there were public indications of growing interest in such an X-ray kill mechanism. See the testimony of DDR&E director John S. Foster, Preparedness Subcommittee Test Ban Hearings, p. 491. It is important to note that RV shielding protection has a central impact upon the relationship between ABM miss distances and kill probabilities. For very close miss distances, even the most massive RV shielding would probably prove ineffective in preventing successful intercept. However, at the somewhat greater ranges associated with likely exoatmospheric ABM miss distances, the shielding issue does imply the ability to prevent RV destruction in some cases.
for the exoatmospheric interception task completed the conceptual process of developing a true area defense.

The discrimination issue remained an interesting question for the defense community as those scientists contemplated area defenses. The issue was effectively eliminated in certain scenarios through the assumption that Chinese and other Nth Country ICBMs would operate at least in their early years without sophisticated penaisds. Such an argument "solved" the discrimination problem versus threats other than the Soviet missile force, but the U.S.S.R.'s offensive penaisd capabilities continued to imply difficulties in exoatmospheric interception. Perhaps the most puzzling observation concerned the MOSCOW ABM: Why would the Soviets, who should understand the extent and sophistication of U.S. penaisd research, nonetheless move to a long-range defense system? Assuming that the Soviet system was not designed solely to counter the Chinese, what kinds of performance did the Russians anticipate from their GALOSH missile?

One interpretation was that the combination of decoy dispersal difficulties and long-range X-ray kill effectiveness allowed extended-range ABM systems to overcome the discrimination problem by simply "killing" everything--warheads and decoys--in the incoming cloud of objects.\(^{27}\)

While such a technique appeared feasible in some instances, a more conservative interpretation led to a second assessment. Penaisd development and deployment had proven to be a costly and difficult task. The

\(^{27}\)Interview S.
majority of current ICBM forces of both the U.S. and the U.S.S.R. were not equipped with elaborate penetration devices, and the installation of such equipment meant losses in warhead payload otherwise devoted to nuclear yield.

A number of DDR&E personnel therefore raised the same question which the Army had posed in earlier rounds of the NIKE-ZEUS deployment debate: Was it reasonable to anticipate that a future U.S. ABM could operate for a number of years without being countered by large-scale enemy penaid deployment? While the majority of defense scientists appeared to reject the idea that the Soviet threat would remain undecoyed in the face of a U.S. missile defense, two other observations made exoatmospheric ABM systems attractive nonetheless.

As already mentioned, the long-range system could provide a considerable defense capability versus the Chinese and other primitive ICBM forces which might evolve in the 1970's. Additionally, DDR&E analyses argued that, even if an enemy ICBM force did utilize some degree of penetration aids, there were advantages to be gained by operating a two-tiered, area/terminal ABM. By combining the exoatmospheric interceptor with the currently proposed NIKE-X configuration, the defense gained the opportunity to utilize the area defense to (a) protect regions otherwise vulnerable due to lack of SPRINT batteries, and (b) provide an initial filtering device capable of reducing the number of

28 Interview Q. An important forum for many of the revisions in DDR&E thinking concerning ABM systems in 1965 was provided by a study titled PEN-X, which examined the offense-defense relationship and studied alternative penetration techniques and ways in which ABM systems might counter these methods.
RVs arriving over SPRINT-defended areas.\footnote{Ibid., The PEN-X study played a key role in emphasizing these particular points.}

The heightened visibility of two strategic factors, the MOSCOW ABM and the predicted Chinese ICBM capability, had led defense scientists to reorient their thinking concerning long-range missile defense systems. By stressing the desirability of countering an unsophisticated Chinese force, DOD officials could conceive of a "thin" area ABM which would not be hindered seriously by discrimination problems above the atmosphere. Still another argument which assumed some importance in this process involved the target allocation possibilities inherent in area defense. While NIKE-X's limited range forced that system to place missiles near every target deemed worthy of protection, an area ABM allowed single batteries to defend large numbers of targets. Within DDR&E, the idea of "preferential defense" was born, and this view reinforced the arguments for area defense systems.\footnote{The "preferential defense" concept, while interesting in the abstract, is plagued with numerous practical difficulties. These problems are discussed in detail in Chapter 10.}

Certain defense scientists saw such an ABM as able to confuse an enemy's ICBM targeting so as to reduce the offense's cost ratio advantage \textit{vis-à-vis} the defense. The popular thinking went as follows:

Because of the long range of an area interceptor, the defense can choose to defend some targets and abandon others. Because the offense doesn't know the choices, he must assume that each target he attacks is defended by all or most of the interceptors within range—or run the risk of failing completely. His targeting is inefficient, more costly, and the cost ratios again tend to improve for the defense.\footnote{Fink speech, p. 12.}
Although the "preferential defense" concept would later come under serious doubt by OSD, the argument was an important aspect of the growing interest in area defense in 1965. 32

These strategic arguments allowed DOD to integrate a number of technological concepts into a "thin" area defense. The X-ray warhead was already available, as was the small phased array battery radar, the MSR. All that remained was for the technical community to provide an effective long-range acquisition radar and the extended-range interceptor. By May, 1965, DDR&E was well along in developing the former, and the Army moved to secure a program for the latter. On May 24, the Army requested to DDR&E that $22 million be made available from the "emergency fund" to allow that service to pursue a "breakthrough in technology" in the ABM area. 33 This money was released, and a contract was let to Western Electric for design work on the DM15X2, the official designation for an advanced ZEUS interceptor.

NIKE-X IN NEW PERSPECTIVE: THE FY1967 BUDGET PREPARATIONS

The area defense concept had ramifications which went well beyond the technical and strategic implications of an unsophisticated Chinese threat. Throughout the summer months of 1965, Secretary McNamara and his advisors gradually moved to a new position on the ABM deployment issue, a position which injected a number of different considerations into the basic debate. In comparing a "thin" area defense to previous

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32 Interview G, Interview Q, Interview T.

33 See DOD Appropriations for 1966 (Senate), Part 2, p. 556.
versions of the Army's NIKE-X recommendations, OSD saw three important circumstances influential in the political battle over deployment. First, an anti-Chinese system represented a compromise level of expenditure which fell somewhere between the alternatives of no ABM and the Army's most extensive and costly anti-Soviet defense. Second, the area defense capability, when taken in conjunction with the anticipated small size of early Chinese ICBM forces, cast a new perspective on the fallout shelter issue.

With true area defense, the "upwind" tactic was no longer available to the attacker as a means of inflicting fatalities on defended cities. An area system could intercept an RV aimed twenty or fifty miles upwind of a city as easily as it could if the warhead was aimed directly at the metropolitan area. Further, the idea of a small enemy force made the upwind tactic look even less threatening. While an attacker like the U.S.S.R. might decide it had sufficient ICBMs to conduct an upwind targeting campaign, the tactic looked much less attractive to an enemy possessing only a few missiles. For those who currently opposed deployment of the Army's large NIKE-X system versus the Soviet threat—and Secretary McNamara was among those who felt that such a move would be unwise—the thin system offered the potential of a political compromise. By June of 1965, a number of informed press sources had indicated the Secretary's growing interest in the anti-Chinese system.

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34 This set of observations is detailed in Donald Zylstra, "No Technical Bars to Deploying NIKE-X," Missiles & Rockets, Vol. 17, August 2, 1965, p. 15.

In the months prior to the Defense Department's final formulation of the FY67 budget in late 1965, a number of DOD studies and papers examined the ABM question from different perspectives. Early drafts of the Strategic Forces DPM placed equal emphasis on the anti-Chinese and anti-Soviet capabilities of various ABM deployments.\(^{36}\) Included in the anti-Chinese portions of these analyses was the realization that it was the inclusion of the proposed exoatmospheric interceptor--the DM15X2--which made "thin" defense configurations look attractive. The kinds of costs which were associated with this type of deployment were in the $8-10 billion category, compared to figures above $20 billion for anti-Soviet systems.\(^{37}\) The "thin" system, nicknamed "THIN-X," did include a number of SPRINT terminal defense batteries in key cities, but involved a major reduction in radar units, especially the sophisticated and costly TACMAR.\(^{38}\)

As for the need to consider deployment of a thin ABM in FY66, the OSD conclusion was that the Chinese threat would not evolve until the early to mid-1970's. Given the lead times anticipated for the


\(^{36}\) Interview N, Interview R. Present too was the assessment that a full shelter system was no longer a high priority requirement for thin anti-Chinese defenses. See Zylistra, "No Technical Bars...," p. 15.


\(^{38}\) Interview B. The TACMAR was the second generation phased array successor to the original multi-battery control radar, the MAR. This was the single most costly component of all the elements of the Army's original NIKE-X system.
Army's ABM program (generally estimated at 4-5 years), a deployment decision could safely be deferred until a later date. This judgment was predicated both upon the estimate of the relevant dates (the OSD consensus preferred a 1974-76 range) and upon assumptions concerning the size of the Chinese force at these points in time. While it was possible to define the threat as existing when the Chinese attained an R&D capability (5-20 prototype missiles), analyses at this time referred to a somewhat larger (20 or more) ICBM production capability.39

The FY67 budget preparations also found OSD analysts performing a kind of study which could have placed ABM in a different role. The United States' primary strategic objective of deterrence was implemented through provision of the Assured Destruction capability. This capability, requiring as it did that the U.S. offensive retaliatory forces represent a credible deterrent under conditions where an enemy struck first, depended upon the survivability of those forces even in scenarios involving extensive Soviet counterforce targeting. Prior to 1965, U.S. assumptions and intelligence regarding the numbers and accuracies of the Soviet ICBM force had led to the conclusion that the hardened and dispersed American MINUTEMAN forces were not vulnerable to such a counterforce first strike.

However, within the defense community it was well understood that future quantitative or qualitative improvements in the Soviet missile force could change the status of MINUTEMAN vulnerability. The public

39 This analysis would change over time, and the size and lead time assumptions were the subject of later debates. Interview P, Interview V. See also "Chinese Nuclear Threat Pushes Studies of Nike-X Options," Missiles & Rockets, Vol. 16, May 31, 1965, p. 17.
coverage of the U.S.S.R.'s May 9, 1965, military parade in Moscow gave early indications that such improvements were probably already underway.\footnote{See Hanson W. Baldwin, "Missiles of Soviet and U.S. Compared," New York Times, May 16, 1965, and Robert Loebelson, "New Soviet Missile Deployment," Space Age News, October, 1965.} As OSD analysts examined the five year planning cycle relevant to the FY67 budget, they investigated a number of options capable of reinstating any U.S. Assured Destruction capability which might be negated by an improved Soviet offensive threat. However, these options did not include the Army's ABM system in a hardpoint MINUTEMAN defense configuration.\footnote{Interview N.} While the hardpoint option was well understood by the planners involved, the threat under consideration was a 1970 Soviet capability, and the judgments on NIKE-X included the observation that a hardpoint ABM could not be deployed by that date in the size and level of high confidence performance required for the Assured Destruction role.\footnote{Ibid. It was the demand for high confidence (low uncertainty) performance which made NIKE-X look undesirable in the MINUTEMAN defense role at this time. In a political sense too, NIKE-X suffered from lack of support in this particular context because even the system's strongest advocates had not sought deployment under the limited hardpoint rationale. Their case had been argued almost wholly in terms of full anti-Soviet population defense.}

Although the above analysis rejected ABM systems as a viable option in the 1965 study, the theoretical underpinnings of that planning approach had important ramifications for future strategic policy. In 1965, Secretary McNamara himself introduced a new concept into the force structure planning procedures for strategic weaponry. Up until the FY67 budget, the Assured Destruction calculations had been based upon
the annual National Intelligence Estimate (NIE) concerning the Soviet threat. It had been McNamara's experience that Congressional challenges to OSD force structure plans tended to argue that the NIE underestimated the Soviet future threats, even at the "high" end of the ranges provided by that estimate.\textsuperscript{43}

In an effort to take into account the possibility that the NIE was not a conservative enough assessment of enemy potential, the Secretary directed his analysts to develop a technique for postulating a "greater-than-expected" threat (the GTE). While the GTE threat levels were not to be used as a basis for a series of procurement decisions, they were designed to indicate areas where hedges--preliminary expenditures designed to maintain certain options--could later be extended to meet the possibility of the GTE threat's actual evolution. When the Assured Destruction forces were analyzed in 1965 in conjunction with the first GTE data, the OSD policy response was to accelerate the development of the Navy's POSEIDON missile. The timing of an actual deployment decision on this very-low-vulnerability offensive system would depend upon how the Soviet threat actually evolved.\textsuperscript{44}

The position taken by Secretary McNamara on ABM deployment in October, 1965, stressed three observations. First, NIKE-X could not provide--given Soviet offensive capabilities--any significant degree of damage limitation versus the U.S.S.R. Second, as an Assured Destruction device \textit{vis-a-vis} that same threat, a hardpoint ABM deployment

\textsuperscript{43}Interview W, Interview V.

\textsuperscript{44}Ibid. See also \textit{1966 Posture Statement}, p. 59; Interview P.
was not as attractive as modifications or additions to the U.S. offensive forces. Finally, as a damage limitation device against a potential Chinese ICBM force, the new area defense components made an ABM deployment appear quite useful, but any decision to build such a system could safely be deferred due to the NIKE-X system's lead time advantage over the Chinese offensive missile program. In light of these beliefs, OSD again contemplated limiting ABM funding in FY67 to the research, development, testing, and engineering (RDT&E) areas, with no request for production monies planned.

Army officials had themselves conducted new and detailed studies of alternative ABM systems and their potential contributions to strategic posture. One analysis in particular, the DEPEX (Deployment Exercise) report, gives indications of the kinds of considerations being weighed by the Army. Presented to OSD in October, 1965, DEPEX conceived of a multi-stage deployment plan which began with a relatively thin ($5-8 billion) area defense system which was to be gradually "thickened" until it eventually became the expensive 50-city version of an anti-Soviet NIKE-X system.45 While the Army continued to insist upon the large-scale anti-Soviet deployment as that service's only fully acceptable ABM configuration, the NIKE-X program requested for the FY67 budget indicated the realities of the current political situation. Even

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should ABM advocates succeed in overcoming the opposition of the Secretary of Defense, the resource constraints imposed by the increasing commitment to the war in Vietnam necessitated a moderate Army stance.

In keeping with the kind of deployment analysis which had been a part of Army-OSD discussions since early 1965, the Army presented a detailed budgetary package built around a four-phased ABM procurement plan. The phases reflected the DEPEX conclusions: Begin with a thin system--Phase One--using a mix of SPRINT and DM15X2 interceptors to give area coverage. This capability would be operational in approximately four years.46 By adding more MSRs and SPRINT missiles, Phase Two--a system almost identical to the first increment of ABM deployment used by McNamara in the 1965 Posture Statement analysis--would be attained some 24 months later.47 Phases Three and Four involved even more additions of radars and interceptors leading to a very heavy defense against the Soviet threat.

For the FY67 budget, the Army's NIKE-X program required less than $200 million for preproduction funding, although costs in the second and third years would be in the $1-2 billion range.48 That service's October, 1965, ABM request included $343 million for RDT&E, plus $188 million for preproduction. While these figures represented the Army's preferred program, the budget request did recognize that other defense

46 Ibid. (Beecher). The costs for Phase One were set at under $5 billion.

47 See p. 47 of that Posture Statement. Phase Two was basically a NIKE-X deployment modified by (a) the presence of someexoatmospheric interceptors, and (b) a cost reduction realized through reduction of the number of TACMAR radars.

48 Beecher, "Nike-X in the Balance."
demands could make full program funding difficult to attain. In light of this, a number of intermediate plans designed to stretch costs over a longer period of time were suggested, and these Army alternatives reduced the FY67 preproduction request down to $100 million in one instance. 49

THE PRESIDENT SAYS "NO," AND THE SEEDS OF FURTHER CONTROVERSY ARE SOWN

By the time President Johnson prepared to hear the final budget recommendations of OSD and the Joint Chiefs of Staff in the last days of 1965, the ABM issue had undergone three important changes. First, the area defense technology and the Chinese threat combined to generate one type of ABM deployment which was favorably received by a large number of both military and civilian defense officials. For DOD's technical experts in particular, a thin area defense looked quite attractive, and only the lead time issue seemed to stand in the way of such a limited deployment. 50 Second, continuing U.S. intelligence efforts indicated major new Soviet offensive and defensive weapons work, along with gradual Chinese ICBM development. These factors acted to raise Congressional attention concerning possible U.S. policy responses to counter enemy advances, and one such response which was popular among members of the defense-related legislative committees was NIKE-X.


50 The extent to which DDR&E and ARPA officials backed the "thin" deployment concept will be documented in Chapter Nine.
The third factor involved the nature of the JCS arguments for deployment of the Army's system. The primary objective of the Chiefs remained the attainment of the anti-Soviet version of NIKE-X, and ABM advocates had in the past failed to maximize support for their plans because they had couched their arguments in "all or nothing" terms. In the two budget cycles where Army requests had emphasized less-than-total anti-Soviet deployments (the FY62 and FY63 limited production plans fostered by the Ad Hoc ZEUS Committee), support for ABM procurement appeared to have been the highest. While the JCS did not view the deployment of a thin area defense as a particularly useful step in its initial form, such a move could provide an effective political entree to funding of the Chief's preferred levels of missile defense.

Additional circumstances relevant to the ABM question in December, 1965, provide clues to the status of the deployment debate in the years to follow. President Johnson, in considering the Army's recommendations on NIKE-X, was aware of the following considerations: First, Secretary McNamara continued to sound optimistic as to both the feasibility and utility of an anti-China ABM, and discussed deferral of any deployment decision not so much in terms of technological constraints but in terms of the estimates of Chinese ICBM development progress. Second, the "package" implications of OSD's Damage Limitation concept led to increasingly more unified JCS support for the Army's production

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57In addition to voicing his arguments in earlier Congressional testimony, McNamara used the December 15 Paris meeting of the NATO Defense Ministers to elaborate upon the practicality of an anti-Chinese ABM deployment. See Peter Braestrup, "McNamara Warns NATO of Chinese Atom Threat," New York Times, December 16, 1965.
plan. While the package concept was both a logical outgrowth of OSD's systems analyses of nuclear war and a potentially useful political barrier to ABM funding due to its insistence on large expenditures on other less popular defensive systems, the approach was beginning to have a new effect on the funding debate.

ABM advocates had countered the package format in part by arguing that one had to start with something and that NIKE-X was an important system even if other kinds of defense (shelters, anti-bomber defense) were not improved greatly. In addition, had the various damage-limiting systems been separated, the mechanics of interservice rivalry could conceivably have left the Army somewhat isolated in its desire to attain large ABM deployment levels. Since the introduction of the damage limitation analysis in 1963, however, the services had demonstrated a growing tendency to back all of the programs in the package, and this included Army, Navy, and Air Force systems.

The third factor which received the President's attention at this time concerned the strategic instability critique of ABM deployment, the unfavorable view of the "action-reaction" phenomenon in the nuclear arms race. In late 1965, a fourteen-member committee formed in conjunction with the "White House Conference on International Cooperation" met to discuss a wide range of issues relevant to future arms control possibilities. Chaired by the former Science Advisor to President Kennedy, Jerome B. Wiesner, the panel recommended among other things that the United States should postpone for at least three years the deployment of any ABM systems. Arguing that the long-term political ramifications of such a deployment could seriously hinder chances for
improvements in Soviet-U.S. relations, the conference challenged the logic of the view that an American "anti"-Chinese ABM would not affect the Soviet view of the U.S.  

These three factors were known by President Johnson in December, but the extent to which they would influence his decision on the Army's funding requests depended in turn upon more general issues facing the administration. Even before his annual formal defense budget meeting with McNamara and the Joint Chiefs, the President had made it known that the serious economic constraints imposed by the nation's resource commitment to the Vietnam war demanded strict spending limits in other areas of the budget. The result of this situation was that the services were faced with the fact that, given the President's feelings about acceptable total dollar levels, Vietnam-related defense programs took precedence over certain other military programs. It was therefore possible for Secretary McNamara to gain JCS agreement that ABM production should be deferred at least until the FY68 budget.

As for political criticism of this omission of NIKE-X production funding, a second administration decision at this time served to focus Congressional attention onto a different strategic weapons issue. In preliminary meetings on the budget, McNamara had secured Presidential acceptance of a plan to phase out gradually the main element of U.S. strategic bomber capability, the B-52 force. Controversy over the advisability of this move and the associated replacement program involving the much-debated TFX aircraft maintained the major attention of

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the Congress and the press. The plan for ABM funding which the President approved at the LBJ Ranch on December 11 was the one recommended by OSD in response to the original Army proposal in October. The $188 million preproduction fund was omitted, as was $17 million in production-related RDT&E money, leaving a $417 million dollar request for continued research, development, and testing, but no deployment.

A U.S. President had once again decided against deployment of an ABM system, but the tenor of the debate seemed to be shifting more and more in the direction of deployment. The Army had accepted the argument that good things might not always come in big packages, and had sought levels of initial deployment much less objectionable to DOD officials. The defense technical community, which had for years provided some of the greatest critics of Army ABM systems, appeared strongly in favor of a limited area defense system. Even Secretary McNamara, whose grounds for opposition to large-scale NIKE-X funding ran the gamut from technical

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54 See DOD Appropriations for 1967 (House), Part 5, pp. 155, 161, 163-168. The ABM program was further supported by allocations of $30 million for military construction and $119 million for ARPA's Project DEFENDER.

55 Dr. Foster and other DDR&E officials appeared to support the idea of a thin area defense, in opposition to earlier DDR&E views against ABM deployment, for two primary reasons. First, the idea of a limited system designed for limited objectives (Nth country attack, accidental launch) did not raise for these men the kinds of negative arms race connotations associated with the Soviet threat and efforts to defend against that force. Second, the limited objectives (and assumptions about small and unsophisticated enemy attacks) led DDR&E to a much more optimistic assessment of ABM feasibility and performance. Given these two conclusions, it was not unpredictable that the technicians, feeling they had built what OSD had asked for, would strongly support the area defense.
objections to fears of wasteful and dangerous arms competition, indicated a more favorable attitude toward a missile defense designed to counter the Communist Chinese. The events of the next twelve months, from January to December, 1966, would demonstrate the extent to which these various factors were operating, and would yield a new influx of political pressure to fund NIKE-X.
PART III

THE ABM DEBATE
STRATEGIC DEFENSE AND NATIONAL SECURITY

by

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CHAPTER IX

THE JOINT CHIEFS UNITED: SUPPORT FOR ABM GROWS

In previous years, Secretary McNamara had used his annual Posture Statement as the formal medium through which to communicate administration thinking concerning the entire range of American defense policy. The strategic forces area was of special concern for the Secretary, and the continuing and often heated debate on general nuclear war planning and strategy found McNamara's own position emerging as the overriding determinant of U.S. policy in this area. While President Johnson maintained final authority in such matters, he appeared to have accepted the recommendations of his Defense Secretary, if not wholeheartedly, at least without significant Presidential revision. In examining the FY67 budgetary debate as it relates to the ABM issue, it is useful to review the content and background of McNamara's 1966 Posture Statement.

THE ANTI-CHINESE ABM AND DAMAGE LIMITATION

In assessing the capabilities of the programmed U.S. strategic nuclear forces, Secretary McNamara again structured his evaluation around the assured destruction and damage limitation objectives which he had set forth in previous statements. In answer to arguments by the Army and some legislators that NIKE-X was needed (aside from its damage limiting role) as a deterrent versus the Soviet threat, McNamara argued that the U.S. strategic offensive forces "are far more than adequate..."
to inflict unacceptable damage on the Soviet Union."¹ This view that no additions were currently required for the assured destruction objective was meant as an answer to both the above criticism regarding ABM policy and to the growing objections to the administration's announced deemphasis on bomber forces.²

While OSD rejected the argument that NIKE-X in its large city-defense configuration was necessary as a deterrent, that organization's planning analyses did indicate a possible future use of missile defense in the assured destruction role. McNamara described his staff's use of the "greater-than-expected" (GTE) threat to hedge against possible unanticipated increases in the Soviet strategic forces. He indicated seven issues relevant to the GTE analysis, each involving a possible U.S. response to such Soviet improvements. One of these issues, in addition to five offensive force structure modifications and civil defense improvements, was ballistic missile defense.³ Although the Posture Statement did not elaborate the point, the ABM configuration contemplated here was the "hardpoint" defense of U.S. MINUTEMAN forces. There was little indication of major military support for this deployment alternative, but it nonetheless represented another potential type of compromise funding level for NIKE-X.⁴

¹1966 Posture Statement, p. 48.
²Ibid., pp. 49-50.
³Ibid., p. 59.
⁴For a discussion of this type of ABM deployment, see the testimony of DDR&E Director John Foster in DOD Appropriations for 1967, Joint Hearings before the Armed Services Committee and DOD Appropriations Subcommittee, U.S. Senate, 89th Cong., 2nd Sess., Part 1, p. 425. The Army
Turning to analysis of damage limitation, the Secretary's presentation again reflected the influence of aspects of the ongoing OSD-JCS debate on NIKE-X deployment. Perhaps the central issue in that debate was the question of Soviet reactions to a U.S. ABM deployment. If damage limitation calculations utilized the assumption that Soviet strategic forces would not undergo significant improvements in response to a large U.S. ABM deployment, then U.S. fatalities could potentially be reduced from a high of some 130-135 million down to 20-80 million, depending upon the scenario and input assumptions made in the calculations. It was this set of figures, those assuming no major Soviet response to NIKE-X, which the Joint Chiefs used in supporting deployment of that ABM system. It continued to be Secretary McNamara's position that the U.S.S.R., because he felt that nation operated on an

focused almost exclusively on population defense, and showed little interest in hardpoint systems. The Air Force, a potential JCS ally of the Army in ABM questions, was opposed to the hardpoint idea too, specifically because the former service was itself the sponsor of four of the five offensive alternatives (manned bombers, MINUTEMAN improvements, new penaids, and new manned interceptor) to such a deployment.

*1966 Posture Statement*, pp. 53-54. For a Soviet first strike, the U.S. fatality figures were given as 50-80 million; for a U.S. first strike, 20-30 million. McNamara explained that the ranges of numbers reflected possible alternative assumptions concerning Soviet targeting doctrine, technological sophistication, errors in attack planning, and command/control performance. The Secretary himself had insisted in late 1965 that future analyses of this type make explicit the reasons for the ranges expressed, and he passed the explanation on to readers of his statement (see p. 54).
"assured destruction" planning philosophy similar to that of the U.S., would respond to NIKE-X by adding a number of large, penaid-equipped ICBMs, an extensive ABM system, and a qualitatively better and numerically larger manned bomber force to its current structure.

The Posture Statement's damage limitation presentation therefore included a second set of fatality numbers corresponding to this ABM-inspired Soviet threat increase. Under this "USSR Threat II," the Soviet first strike scenario yielded 75-100 million U.S. deaths, an increase of some 25-50 percent over the "USSR Threat I" calculations.\(^6\) McNamara's conclusions based upon these analyses repeated the key observations of the 1965 Posture Statement: First, there was little hope of reducing U.S. fatalities below some 50 million in the event of Soviet surprise attack, even if the administration were to make a massive resource commitment to damage limitation. Second, he stressed the need as OSD perceived it to provide a broad mix of defenses, including shelters, ASW, and bomber defense as complements to any ABM deployment.\(^7\)

In discussing the potentials of ABM technology, the statement did indicate that the new area defense capability could complicate even a sophisticated attacker's penetration problem, but noted that such a conclusion was only tentative, given uncertainties regarding the design and performance of missile defenses using the planned exoatmospheric

\(^6\) Ibid. The U.S. first strike figures suffered a corresponding increase to 25-40 million.
interceptor. McNamara concluded his assessment of ABM systems and the Soviet threat by emphasizing his belief that problems of costs and uncertainty as to the U.S.S.R.'s response to a NIKE-\(\chi\) deployment dominated the issue of whether or not such a system should be built:

We should not now commit ourselves to a particular level of Damage Limitation against the Soviet threat---first, because our deterrent makes general nuclear war unlikely, and second, because attempting to assure with high confidence against all reasonably likely levels and types of attack is very costly, and even then the results are uncertain.\(^8\)

Shifting his ABM discussion from the Soviet threat to that of Communist China, the Secretary indicated his view of the strategic contribution which even a limited U.S. missile defense might make against smaller threats:

The development and deployment of even a small force of ICBMs might seem attractive to them [the Chinese] as a token, but still highly visible, threat to the U.S., designed to undermine our military prestige and the credibility of any guarantee which we might offer to friendly countries. The prospect of an effective U.S. defense against such a force might not only be able to negate that threat but might possibly weaken the incentives to produce and deploy such weapons altogether.\(^9\)

McNamara then postulated two alternative "thin" ABM deployments against the potential Chinese threat, one a SPRINT-only terminal defense of a number of cities, costing $8 billion, and the other a combined SPRINT/DM15X2 terminal and area defense covering the entire nation for some

\(^8\)Ibid., p. 56.

\(^9\)Ibid. An indication of OSD's growing awareness of the Chinese potential to threaten the U.S. with nuclear force is found on p. 210 of the Posture Statement, where the text of Chinese Communist Party Chairman Lin Piao's "Long Live the Victory of the People's War" speech is included as an appendix.
$10.6 billion. He noted too that such deployments could be effective in conjunction with "something less than a Full Fallout Shelter Pro-
gram." This was possible because of the relative absence of extensive fallout-creating counterforce targeting or use of the "upwind" city attack tactic due to the very small size of Nth Country ICBM forces. Furthermore, the area defense configuration might succeed in denying the "upwind" tactic to a small attacker even if it chose to attempt such targeting.10

The Posture Statement then presented calculations of U.S. fatalities resulting from small ICBM attacks of the sort that the Chinese Communists might be able to mount in the latter part of the 1970's. An extension of currently approved programs (which provided no ABM) yielded an estimate of 6-12 million casualties as the result of such an attack. The terminal version of a thin ABM yielded 3-6 million, while the terminal/area combination reduced the figure to 0-2 million. McNamara emphasized two points based on these data: First, the addi-
tion of the area defense components yielded a system which was much more effective than the original SPRINT-only version of thin deploy-
ment. Second, this same area defense capability gave hopes of achieving for the first time a high confidence defense against small attacks, not just for a few selected cities, but for the entire United States.11

10 Ibid., p. 57. With an extensive area defense, there would not be any unprotected "upwind" regions where an enemy could detonate a nuclear weapon unmolested by the ABM system.

11 Ibid., pp. 57-58. Both configurations of the thin system con-
In formulating OSD's conclusions on ABM policy for FY67, Secretary McNamara presented both a favorable and an unfavorable view of the ultimate utility of such systems. As for an anti-Soviet deployment, the size, sophistication, and potential for reactive growth characterizing the U.S.S.R.'s ICBM force made any effort to defend against that threat appear futile. If the issue was defense against the evolving Chinese missile threat, however, a light ABM deployment had the potential of providing "a highly effective defense" which would be able to maintain such effectiveness "for some time." 12 In addition, an initial limited deployment could be improved qualitatively and quantitatively as the Chinese ICBM force made similar improvements. While R&D on the various systems which made up the U.S. ABM program would be "pressed forward vigorously," a decision on deploying the system against the Chinese could be deferred until a later date. 13

ALTERNATIVE DEPLOYMENTS: NIKE-X THROUGH THICK OR THIN

As the Defense Department presented its FY67 budgetary plans, which included the above position on ballistic missile defense, to the Congressional committees charged with authorizing and appropriating funds for defense programs, there were signs that the ABM issue

12 Ibid., pp. 58, 70.

13 Ibid. The date generally used by OSD and the Army to designate the anticipated existence of the Chinese threat was 1975. Estimates of deployment time for an anti-Chinese ABM contemplated a four-year period from decision to initial operating capability, and two to three years more before installation of the entire system would be complete. See Robert M. Loebelson, "NIKE-X: Down Payment on Millions of Lives," Journal of the Armed Forces, May 28, 1966.
had grown larger as a political issue. It is difficult to attribute specific reasons for increased Congressional desire for NIKE-X deployment, but two factors appear relevant. The same legislators whose perceptions of the strategic situation led them to criticize Robert McNamara's gradual decrease in expenditures on strategic weaponry since FY1962 were also among the strongest proponents of NIKE-X. The administration had rejected service requests for major funding on such new strategic systems as AMSA (Advanced Manned Strategic Aircraft) and an advanced manned interceptor in FY67, and military supporters in both Houses appeared increasingly frustrated by McNamara's weapons acquisition policies.\footnote{See Ibid., pp. 60, 61, and 68 for McNamara's views on these new strategic weapon systems. Strategic Forces budget totals for FY62-FY66 were (in billions of dollars): 11.2, 10.4, 9.2, 7.3, and 6.7.} In addition, many of these same Congressmen felt that the Johnson administration's conduct of the war in Vietnam had not adequately utilized the potentially overwhelmingly U.S. advantage in both land and air forces, thus adding another issue to the legislators' frustration.

Reinforcing Congressional antagonism regarding the administration's defense policies was the growing volume of U.S. intelligence data on Soviet defense work. The information was sketchy, but this uncertainty simply fueled the debate within the intelligence community as to the exact character of the Russian effort. In the three years since Senator Strom Thurmond's secret Senate session on Soviet ABM progress, the U.S.S.R. had apparently abandoned any efforts to
expand its "Leningrad system" of missile defenses. Construction on possible extensions of the newer "Moscow ABM," whose discovery was first made public in 1964, had been sporadic, and had been delayed for long periods of time, seemingly because of design difficulties. However, by early 1966, American intelligence had become aware of two separate developments within the U.S.S.R.

First, work had begun again on the ABM system near Moscow, and additional radar and GALOSH missile installations were observed. While the U.S. intelligence community maintained a relatively stable consensus regarding the nature of the Moscow system (it was seen to be an area defense system, capable of protecting the capital city itself plus the surrounding area out to a radius of perhaps a few hundreds of miles), there was little agreement concerning the second development under observation. What U.S. reconnaissance satellites were observing were the initial stages of site preparation

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16 Interview X. See also Norman, p. 30.

17 William Beecher had indicated that the Moscow deployment is designed to utilize 100 ABM interceptors, approximately three quarters of which were in place on their launchers by early 1969. See Beecher's "The Argument for a Thin ABM," New York Times, March 2, 1969.
for scores of potential missile batteries throughout the northwest regions of the U.S.S.R. The absence of construction of actual radars or launchers in these early months of 1966 made assessment of the actual nature of this new system an uncertain business. The physical size of the sites—apparently larger than the Moscow installations—plus the fact that the batteries were generally removed from major cities, led to the prediction that the Soviets were constructing an extended range area ABM defense. Such a system—called TALLINN, after the Estonian city where one of the first installations was observed—would potentially possess a capability to intercept U.S. MINUTEMAN missiles approaching the industrial centers of European Russia via the Arctic.¹⁸

From the very beginning of DOD's testimony before the Congress, it became increasingly evident that McNamara was becoming more and more isolated within his own Department in his strong opposition to immediate ABM production funding. The Secretary's differences with the Joint Chiefs on the issue were evident, and by February 1966, this split was so complete that McNamara insisted that JCS Chairman General Earle Wheeler describe to the Senate hearings the military's views on NIKE-X. Wheeler's testimony emphasized three points: Immediate action should be taken to initiate deployment of the

¹⁸See Norman, p. 26; Beecher, "Pentagon Readies Arms to Penetrate..."; and Gwertzman, "U.S. Aides in Quandry...". Information on TALLINN was closely held by the intelligence community, and only a limited number of Congressmen appeared to have any extensive knowledge of the program. However, those with access to these data were for the most part the same legislators responsible for authorizing and appropriating the DOD budget.
anti-Soviet version of NIKE-X; overall costs, while obviously great, should not be used as an argument against attempting to defend the U.S.; and the action-reaction phenomenon, far from being undesirable, in fact benefited the U.S. due to the Soviet's relative resource disadvantages and spending capabilities. While General Wheeler supported funding of the entire package of damage limiting systems, he argued that it was inadvisable to procure all those systems at once, and that the "package" should not be used as an obstacle to rapid funding of NIKE-X. ¹⁹

By themselves, the OSD-JCS differences were not new, but as the budget hearings began to investigate the specific funding requests associated with the ABM program, the Congressmen were treated to a major shift in the character of the missile defense debate. In previous years, the most heated public exchanges on the issue had taken place between ABM supporters and the civilian technical experts in DOD. Some of the strongest critics of NIKE-ZEUS and NIKE-X had come from the ranks of DDR&E and ARPA--men like Herbert York, J. P. Ruina, and Harold Brown. In 1966, however, the concept of a thin area defense worked a remarkable change on the DOD scientists, and the resulting dialogue in the hearings indicated growing support for limited ABM systems.

While DDR&E and APRA officials continued to oppose any attempt to produce an anti-Soviet type of NIKE-X system, the current directors of the two organizations were quite enthusiastic as to the United States' ability to construct an effective missile defense against smaller ICBM threats. DDR&E director John Foster emphasized the importance of the new DM15X2 in allowing deployment of thin ABM systems which could keep pace with the type of threat associated with potential Chinese ICBM capabilities. He then indicated a second possible use of ABM defenses:

Both the area and terminal phases of NIKE-X have a potential for hardpoint defense of MINUTEMAN and any advanced ICBM's which might be deployed. Studies are now underway on the most effective way to defend our offensive forces and will include comparison of NIKE-X versus other technologies and strategies.20

In his March appearance before the Senate Appropriations Subcommittee, Foster had set the costs of a thin anti-Chinese ABM deployment at $9-12 billion, a range similar to that used by McNamara in the Posture Statement.21 In his April testimony to the corresponding House group, 

20 DOD Appropriations for FY1967 (House), Part 5, p. 33 (See also pp. 32-40). The DDR&E optimism concerning ABM performance was not shared by the relevant scientific panel of the President's Science Advisory Committee. PSAC's ABM panel, reorganized under Dr. Wolfgang Panofsky in 1965 as the "Strategic Military Panel" and headed in 1967 by Dr. Marvin Goldberger, rejected the utility of the building block idea, and viewed a limited missile defense as potentially useful, but only in specific circumstances. Even this assessment was challenged by a number of PSAC members, many of whom perceived the threat of large ABM expenditures for an ineffective and futile heavy anti-Soviet defense as being greater than the benefits of a small deployment which might provide a political wedge toward these larger systems. Interview Y, Interview Z.

21 DOD Appropriations for 1967 (Senate), Part 1, p. 455.
he introduced a markedly different deployment concept, one which stood as a potential compromise between no ABM and the Army's desire for a widespread NIKE-X system. If deployment was to consist only of the area defense part of NIKE-X, i.e., acquisition radars, MSRs, and the DM15X2 interceptor, then a very thin defense of the entire United States could be afforded for a cost of as little as $3-4 billion.

Foster's optimism as to the technological feasibility of a thin anti-China ABM, a position reinforced by ARPA Director Charles Herzfeld, meant that the Army now had a potentially powerful ally in its effort to secure funding of actual ABM deployment. The extent to which Foster supported the idea of a thin system was further illustrated in the DDR&E head's recounting of his review of the Army's FY67 request for $188 million in NIKE-X preproduction money. He indicated to the Senate Appropriations Subcommittee that he reviewed this request and asked Secretary McNamara--who had rejected the entire amount--to restore some $70-80 million so as to reduce the lead time involved with deployment if and when such a decision were made. The Secretary of Defense refused, and Foster again reviewed the request, noting that a small ($4 million) fund for preliminary engineering drawings would by itself reduce deployment lead time by more than six

22DOD Appropriations for FY1967 (House), Part 5, p. 39. See also "Nike-Zeus Holds Key to Effective ABM Area Defense of Continental U.S.," Armed Forces Management, July 1966. The $3-4 billion price was some $1-4 billion less than the least costly option proposed in the Army's earlier DEPEX study. This information was not made public until late June, when the House testimony was released. One of the first public accounts fo the "very thin" system was Michael Gettler's "U.S. Opting for New, Low-Cost ABM," Technology Week, June 20, 1966, pp. 14-16.

23Ibid., pp. 583-596, (especially p. 596).
months. McNamara quickly approved this one item. 24

The Army's presentation in the various hearings indicated that that service had accepted (in part, at least) the utility of request- ing a thin deployment as per the DDR&E view while continuing to stress the need for a full anti-Soviet system at some future point. In dis- cussing his service's FY67 request for NIKE-X preproduction, Army R&D chief General Austin Betts emphasized that, like Dr. Foster, the Army contemplated an initial deployment of a "thin" nature, utilizing only the less costly MSR radars at first, with construction of the sophisticated TACMAR left as a later addition to the system. He noted that the original Army budget had specifically recommended an anti-China system which provided for further growth "to effectively meet more massive and sophisticated threats." 25 Betts also argued that continued deferral of the decision to initiate production could only lead to deterioration of technological competence in that extend ed delay would result in a lag in systems design improvement. 26

In reference to the "thin system" idea, the Army did make it clear that such a deployment was not a desirable end in itself. Such a level of expenditure was viewed only as a first step toward the kind of system contemplated by the Army's original FY67 plan calling for a $23 billion expenditure over a number of years. Army officials

24 DOD Appropriations for 1967 (Senate), Part 1, p. 468.


26 Ibid., p. 163.
seemed especially wary of the idea of limiting deployment to an area defense-only type of configuration. As Army Assistant Secretary for R&D Willis Hawkins told a House panel, "[The area defense-only deployment] is a very reduced kind of system and we should not promote that kind of system. We should have both [long-range and terminal intercept missiles]."  

THE POLITICS OF EXECUTIVE-LEGISLATIVE CONFLICT: CONGRESS TAKES THE INITIATIVE

Reinforced in their views of the ABM issue by the testimony of the Joint Chiefs of Staff and DOD technical officials and increasingly concerned over apparent Soviet ABM progress, the Senate Armed Services Committee directly challenged Secretary McNamara's stand on NIKE-X. This Senate panel, which represented perhaps the strongest group of ABM proponents in the Congress, voted unanimously on April 21, 1966 to add to the DOD authorization bill $167.9 million, to be used as NIKE-X preproduction funds.  

Seven days later, the full Senate approved by voice vote the entire DOD authorization, including both the $167.9 million and additional funds for other DOD-rejected systems.  

Buoyed by the Senate's action, the Joint Chiefs resub-

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Ibid., p. 171.


Ibid. (Wells). Systems supported by the additional funds also included two nuclear-powered Navy frigates ($258.3 million), AMSA ($11.8 million), and production of more YF-12 interceptors ($55 million).
mitted to McNamara their plan for prompt initiation of production and installation not of a thin ABM, but of the full $23 billion anti-Soviet plan. The program request clearly stated that the Chiefs would approve a limited deployment only if it were the first step toward the complete system. 30

The JCS recommendation was unanimous, with Air Force and Navy concurrence reinforced by the inclusion of those services' own damage-limiting systems in the request. There was something for everyone: NIKE-X for the Army, ASW for the Navy, improved bomber defense for the Air Force, even a fallout shelter plan for OSD. Central to the Chiefs' argument was the view that it was reasonable to expect that the U.S.S.R. would not acquire in the foreseeable future the kind of ICBM force (in terms of both size and sophistication) capable of foiling NIKE-X. Because McNamara himself had indicated that current Army systems could be effective against present (undecoyed) Soviet missiles, such an assessment of future Soviet capabilities resulted in a much different view of NIKE-X effectiveness than that held by OSD. 31

McNamara rejected the JCS proposal, but did not discuss the decision publicly. On June 14, the House of Representatives approved its version of the DOD appropriations bill. The Senate had


31 "Effective" was a controversial term. McNamara's Posture Statement (see p. 300 above) had credited NIKE-X with saving as many as 90 million Americans in certain specific scenarios. Even in such cases, the 20-30 million U.S. fatalities involved led some opponents of ABM (including the Secretary) to question the "effectiveness" of such a defense.
retained the $167.9 million NIKE-X fund in its final appropriations bill, and the House measure contained an identical sum.\textsuperscript{32} The Congress' actions in appropriating unrequested funds was by no means new, but the specific wording of the bill angered Secretary McNamara. At issue in the matter was something more than ABM--involved was a constitutional question of the power of the legislative branch to assume authority in the area of "raising armies."\textsuperscript{33} In an appearance before the Senate's Subcommittee on DOD Appropriations in August, McNamara was highly critical of the Congress for its efforts to override executive branch responsibility in such matters, and chastised the legislators for their failure to indicate to DOD just what it was they wished the administration to do with the money in question. Neither house had indicated the size nor type of ABM desired, and the Secretary of Defense asked how his organization was supposed to respond to such a directive.\textsuperscript{34}

McNamara was not alone in his opposition to the Joint Chiefs and the Congressional Armed Services Committees, although the Secretary's supporters were somewhat less vocal than proponents of NIKE-X. Within the administration, he was backed by a number of officials in his own


\textsuperscript{33}A similar controversy had arisen when Congress attempted to direct DOD to proceed with production of the B-70. In 1963, Congressional dissatisfaction over a number of McNamara's weapons procurement decisions led to such efforts, which the administration resisted. See Jack Raymond, "Skybolt Backers Map New Thrust," (SKYBOLT, TFX, and the B-70 were all systems about which McNamara had angered certain members of the Congress) \textit{New York Times}, January 2, 1963; and "RS-70 Fund Voted Again," \textit{Baltimore Sun}, March 14, 1963.

\textsuperscript{34}See \textit{DOD Appropriations for FY1967} (Senate), Part 2, p. 726.
OSD staff, a large majority of PSAC scientists and staff (including President Johnson's Science Advisor, Dr. Donald Hornig), the Arms Control and Disarmament Agency, and Secretary of State Dean Rusk. In addition, the scientific community continued to voice its disapproval of the Army's ABM proposals, and certain of these groups received support from members of the Congress. Soon after the initial Senate action on the controversial $167.9 million preproduction fund, the 2500-member Federation of American Scientists issued a statement opposing any deployment of NIKE-X. The group's arguments were similar to the ones made by McNamara in his most recent Posture Statement:

"Were we to deploy a missile defense, we could expect the Soviet Union in due course to respond no less strongly with offensive weapons of its own. And in turn, efforts to improve Soviet offensive weapons will threaten our own, as well as induce us to still further defensive efforts.... There is no way out of this direction because there is no defense against nuclear war except to avoid one. Attempts to secure such a defense will, by fits and starts, lead only to further spirals of expenditures."

In the Senate, Pennsylvania's Joseph Clark waged a lonely fight against the preproduction fund, citing three reasons why he opposed such spending. Senator Clark stressed the arms race problem, quoting the recommendations of the Wiesner Committee report on the White House Conference on International Cooperation earlier in 1966. He also questioned the basic technical feasibility of ABM systems based upon

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35 The positions of each of these organizations or individuals have been documented in the course of this author's interviews.

current knowledge, and argued that crucial domestic programs would suffer if the U.S. attempted to fund NIKE-X or similar ABM measures. Two other Congressmen, Senator Stephen Young of Ohio and Representative Jeffrey Cohelan of California, also make floor speeches in their respective houses in opposition to the funding. Cohelan also inserted into the record the anti-ABM statement issued by the Federation of American Scientists (FAS). There were no public indications, however, that Congressional opposition to ABM systems extended much beyond a handful of legislators.

Given the basic differences of opinion between Secretary McNamara and many members of the Congress, it is difficult to assess the extent to which the legislators' apparent surge in support for NIKE-X in mid-1966 was based upon any significant commitment to the idea of large-scale ABM defense. For those Senators and Representatives who had advocated missile defense since the days of NIKE-ZEUS, it was clear that this commitment did exist. For others, however, it is possible that a sort of anti-McNamara feeling, dissatisfaction with

37 See DOD Appropriations for FY1967 (Senate), Part 2, p. 140.


39 Two of the major Congressional objections to the Secretary's administration of DOD fit squarely into the NIKE-X issue. McNamara had been challenged for not following the advice of his military experts to a great enough degree, and the JCS position made this a major aspect of the ABM issue. Second, the Secretary had been criticized for delaying the procurement of advanced weapons, and the nine-year history of NIKE-ZEUS and NIKE-X decisions were an example which fit the critics' position.
the Vietnam war, or a desire again to make national security affairs a highly partisan election issue (or any combination of these factors) led to support for the JCS position. Whatever the reasons for each individual, the legislators had become much less receptive to administration defense policy. In contrast to the April, 1963, situation when Senator Russell and other senior Democrats supported President Kennedy on NIKE-ZEUS in opposition to the challenge by Senator Thurmond, these same Democrats had done nothing publicly to oppose the recommendations of the Joint Chiefs or the subsequent Congressional appropriations.

INTERNAL DEBATES AND ACCOMMODATION

The Congress' budget actions and the Secretary of Defense's unyielding response had set the stage in late 1966 for yet another confrontation between the protagonists in the ABM debate, this time in the context of the formulation of the FY1968 budget. Within the Defense Department, a number of activities were in progress in the fall of 1966 which were relevant to the missile defense issue. The intelligence community's continuing uncertainty as to the nature of certain Soviet defensive systems had its impact upon the various organizations in DOD. It was the belief of the majority of military intelligence experts and official opinion of the Pentagon's Defense Intelligence Agency that the complex of missile sites known as the TALLINN system represented the initial stages of a vast and sophisticated ABM defense capable of defending most of European Russia. In addition, these same analysts tended to view the renewed construction on the MOSCOW ABM system as
further evidence of Soviet commitment to a "heavy" anti-missile defense. 40

Taking a much different position on these matters were the Central Intelligence Agency and a minority group of military officials. It was the opinion of this group that TALLINN was not an anti-ICBM defense, but was designed to intercept U.S. bombers. While TALLINN's sophistication might allow it to provide some defense against slower IRBMs and cruise missiles launched from Europe, this school of thought did not credit the Soviet system with any meaningful ability to thwart an attack by U.S. MINUTEMAN or POLARIS missiles. As for the renewed activity on the MOSCOW system, the CIA view was that the Soviets were testing a prototype battery, much as the U.S. was doing at its Kwajalein test facility in the Pacific. While these analysts readily conceded that apparent sophistication of the MOSCOW unit's phased array radar and large extended-range GALOSH interceptor, they refused to accept the interpretation that a wider deployment of that system was imminent. 41

As the intelligence community continued to examine and debate this issue in preparation for submission of the annual National Intelligence Estimate (NIE) in October, OSD and DDR&E analysts were themselves engaged in a number of investigations of the U.S. strategic force structure. In addition to the question of Soviet ABM deployment, a second issue was receiving major attention from defense officials. Current


41 Bernard Gwertzman, "U.S. Aides in Quandry...."
intelligence data indicated a major buildup of ICBMs by the U.S.S.R., a buildup greater than that predicted a year earlier by the 1965 NIE. From a force numbering approximately 200 in late 1964, the Soviets had increased their number of operational ICBM's to between 300 and 470, depending upon one's definition of "operational." Such an increase, when coupled with revised predictions of future Soviet ICBM strength, had potentially serious implications for the status of the United States' nuclear deterrent, its "assured destruction" capability.

Secretary McNamara felt that he had an adequate grasp of the anti-China aspects of the NIKE-X deployment question in the fall of 1966, but he was concerned about the overall significance of this Soviet strategic buildup. To augment the anticipated Army ABM deployment recommendation which would evolve in the normal budgetary process in October, McNamara asked for three additional efforts from various DOD sources. The major effort which the Secretary initiated was a comprehensive study of all potentially useful alternatives for improving the U.S. "assured destruction" capability. This analysis, called STRAT-X, examined not only offensive improvements, but also the possible use of hardpoint deployment configurations of NIKE-X to improve the survivability of the MINUTEMAN force.44


43The draft DPM on strategic forces submitted to McNamara in the summer of 1966 contained an analysis of the thin ABM and Chinese threat. This study, prepared by OSD's Systems Analysis Office, concluded that lead time differences continued to allow a deployment decision of the anti-Chinese ABM to be deferred. Interview P.

44See Whalen, p. 183.
STRAT-X represented the vehicle through which DOD analysts would study the implications of a number of anticipated developments in strategic weaponry. In assessing the implications for future U.S. assured destruction capability, three technological issues assumed critical proportions. First, the quantitative increase in the Soviet ICBM force meant that the U.S.S.R. might be moving toward an offensive posture which would become increasingly capable of conducting the kind of counterforce first strike which could significantly reduce—by destroying MINUTEMAN ICBMs—the U.S. assured destruction capability. The growth in numbers alone was itself less significant than the implications of two other factors. The U.S.S.R.'s ICBM buildup included the appearance of two new second generation missiles, the SS-9 and SS-11, and the SS-9 was credited with qualitative improvement in counterforce potential.\(^{45}\)

The more accurate each Soviet ICBM became, the fewer of such missiles would be required to assure high confidence capability to destroy hardened U.S. MINUTEMAN forces. One Pentagon official stated this situation this way: "As recently as a year ago, we didn't think the Soviets could get a counterforce capability. Now we see the threat."\(^{46}\) While this state of affairs was itself serious enough to prompt the kind of concern which led to STRAT-X, a third issue had even greater implications for future U.S. offensive force survivability. The United States had in the course of its extensive missile research

\(^{45}\)Ibid., p. 87. A combination of increased yield and accuracy made the SS-9 a greater potential threat to hardened U.S. targets than earlier Soviet ICBMs had been.

\(^{46}\)Quoted in Whalen, Ibid.
program discovered that it was feasible to equip a single ICBM with more than one warhead. It was also possible to design the missile's final stage so as to allow each individual warhead to be guided accurately onto a separate target. The concept of "Multiple Independently Targetable Reentry Vehicles," or MIRVs, meant that an enemy ICBM force equipped with such devices could, given anticipated warhead yields and accuracies, destroy a much greater number of U.S. ICBMs than could a force equipped with only single warheads. 47

The MIRV threat existed not in the short term, but in the future. That threat, along with the predictions of quantitative Soviet ICBM increases and accuracy improvements, were purposely exaggerated so as to construct the "greater-than-expected" threat. This technique of long-range planning in turn provided the basis for the remaining two analysis efforts requested by McNamara in the Fall of 1966. CSD's Office of Systems Analysis, in addition to participating in the assured destruction analyses associated with STRAT-X, also investigated the implications of MIRVs and Soviet ABM systems 48 on U.S. damage limitation calculations.

47 MIRVs dictate a smaller total fissionable material payload per ICBM, but sufficient accuracy improvements were anticipated so as to yield more, not less, destructive capability. The larger boosters in the Soviet force (the SS-9s) could potentially replace their single multi-megaton warheads with from three to fifteen smaller-yield MIRVs. Depending upon the number, yield, and accuracy of these MIRVs, a single SS-9 could move from a capability to destroy only a single enemy ICBM to a potential to eliminate two or three such missiles, depending upon the kill probabilities desired.

48 Interview R. A Soviet ABM obviously influences U.S. assured destruction (it reduces the number of U.S. RVs arriving on target), but it also had implications for U.S. damage limitation. If counterforce targeting was to be counted upon by the U.S. to limit damage, then an enemy ABM capable of intercepting such a counterforce attack would reduce that damage limiting capability.
Additionally, both Systems Analysis and DDR&E provided the Secretary of Defense with updated studies of the Army-backed "heavy" NIKE-X configurations. The former organization's report emphasized the many contingencies (accidental launch, Nth Country, limited exchange, and other such scenarios) in which such a deployment could contribute to U.S. defense. The DDR&E analysis elaborated upon the benefits of the "building block" concept now present in NIKE-X design, a concept which allowed a wide range of specific deployment configurations to be selected once a basic commitment to ABM was made. In addition, this report stressed the importance of the recently-developed phased array perimeter acquisition radar (PAR), a unit which greatly increased the response time available to the defense. 49

By late October of 1966, McNamara faced additional issues of importance to the upcoming budgetary debate on NIKE-X. First, the final form of the NIE, while indicating the nature of the intelligence community's split on Soviet missile defenses, provided an essentially conservative estimate of TALLINN: That system could have some ABM potential, so it was prudent to credit it with a capability against U.S. ICBM forces. 50 Second, as expected, the Army had included in their budget submission a major NIKE-X deployment recommendation of the same type as the one proposed for the FY67 budget. The request contemplated a four-phased deployment in which the "anti-Chinese"

49 Ibid., Interview V. This new radar, the PAR, could detect a high-trajectory ICBM out to a range of some 1500 miles, thus allowing the DM15X2 interceptor some ten minutes warning time prior to launch of the ABM. See Fink, "Strategic Warfare," p. 6.

configuration included not just the DDR&E-favored area defense system, but also a major (25 cities) SPRINT deployment. This "Posture A" represented phase two (phase one being the thin area defense), and phases three and four contemplated addition of terminal defenses for 25 more cities.51

While the character of the Army budget request did not represent a departure from the FY67 proposal,52 the degree and intensity of political backing for NIKE-X appeared to have increased markedly in the months since December, 1965. In dealing with the supporters of the Army's plan, the Secretary of Defense initiated a technique which he had used previously with some success to resolve differences on the ABM issue which existed within his own demain in the Defense Department. If McNamara could avoid (or reduce, as he had done in 1965)53 tensions between OSD on the one hand and the Joint Chiefs and the Army on the other, he could realize two gains. First, success in this effort would allow the Defense Department to present to the President a single position on the specific question of NIKE-X deployment in FY68, even though other more general splits concerning the utility of ABM systems would in all likelihood remain unresolved.


52 Contrary to the case in certain previous years, FY68 Congressional testimony did not include specific references to the original Army program request for NIKE-X beyond description of the central phase recommended, i.e., Posture A. The above account is derived from interviews which documented the details of the Army's plans. Interview R, Interview BB.

53 Although the JCS had voted unanimously in late 1965 to back NIKE-X, McNamara had elicited the Chiefs' agreement that the decision to deploy
Second, to the extent that the Secretary could lessen the Joint Chiefs' tone of urgency concerning an anti-Soviet ABM, he could potentially make similar gains regarding the mood of Congress. So long as much of the Congressional support for NIKE-X used the JCS stand as a major reason why McNamara's deployment deferral should be overturned, some sort of accommodation with the Chiefs could reduce the Army's legislative backing. The Defense Secretary therefore initiated a series of specific ABM discussions, on one level involving himself and the Joint Chiefs, on another involving OSD and Office of the Secretary of the Army personnel. As will become clear later, the McNamara-JCS negotiations did not succeed in resolving the basic split as to how and when an ABM should be deployed. However, the second set of discussions did result in a certain degree of accommodation between the Army and OSD.

These latter talks took place between McNamara's Assistant Secretary for Systems Analysis, Alain Enthoven, and Secretary of the Army Stanley R. Resor. One by one, the major points of disagreement between OSD and the Army on the ABM issue were discussed. General agreement was reached concerning basic NIKE-X performance in different scenarios, and OSD conceded that the Army's techniques for damage analysis were preferable to the less sophisticated models previously utilized by Enthoven's systems analysts.54 The third topic of debate which these had to be deferred due to resource constraints (Vietnam), and could be deferred in a strategic sense due to the lead times involved. Interview BB.

54 Interview W. The Army analysis utilized individual models based upon the terrain, size, and other variables unique to each city, while OSD's analysis had used a single population-based approximation technique to determine fatalities in a nuclear exchange.
sessions resolved dealt with an argument which had, after originating among DDR&E analysts in 1965, become a central part of the Army's case for rapid deployment of NIKE-X in the system's "THIN-X" configuration. At issue was the concept of "preferential defense" and the role of that technique in area defense systems.

The great attractiveness of area defense when compared to terminal defense was that, for small enemy attacks, the area defense concept provided a given level of protection with a smaller number of interceptors. This observation was not contested in the OSD-Army deliberations, but an extension of the argument was challenged. It was the Army's view, reinforced by certain DDR&E officials, that one could argue a great advantage of area defense at the other end of the scenario spectrum, for overwhelming saturation attacks when there were more RVs than interceptors. "Preferred defense" was the term used to describe this advantage, and the concept involved the following argument: If an area ABM defense commander realized that more ICBMs were going to arrive over targets than the system could possibly intercept, the defense could concentrate its response so as to maximize the survivability of certain high-value targets while conceding lower-value targets to the attacker.

55To give a hypothetical example: To defend 10 cities against an enemy who possesses only 10 ICBMs, one would need 10 (perfectly effective) terminal ABM interceptors deployed in each of the cities to ensure that the enemy could not destroy any of the targets. In contrast to this total requirement for 100 terminal ABMs, an area defense battery capable of intercepting RVs targeted on any of the 10 cities could provide equal protection with only 10 (perfectly effective) long-range ABMs.

56See Fink speech, p. 12, and Fink, "Strategic Warfare," p. 63. DDR&E deputy director Daniel Fink was a leading proponent of the "preferential defense" idea.
Dr. Enthoven and his aides argued that this position was faced with three important difficulties, and asked that the "preferential defense" concept be deemphasized in the Army's position. The primary objection was that the argument contemplated a scenario which was rather unrealistic: OSD had difficulty in conceiving of cases where an enemy ICBM force was at once so massive as to threaten saturation of an area ABM and yet was so unsophisticated in penaid development that its RVs could readily be identified in the exoatmospheric region. Second, the nature of conceivable nuclear attacks made the task of instructing the ABM as to preferential response a difficult one. The preferential idea was meaningful only for attack levels where the defense was forced by sheer numbers to ignore certain incoming RVs. For smaller levels of attack, where total interception was possible, there was no utility in letting some RVs detonate unmolested. At what point in an attack did the ABM system stop shooting at each and every RV and begin responding preferentially? After ten intercepts, after fifty?

Especially if the enemy's attack arrived in salvos, i.e., waves of ICBMs spaced over time, the defense might not be able to determine the existence of a saturation case until it was too late to operate a preferential defense successfully. It was not at all clear to Enthoven

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57 It is important to recall that the long-range interceptor did not solve the discrimination issue except in cases where penetration aids were not sufficiently separated in flight, thus allowing a single ABM to destroy more than one object with a single shot.

58 The problem may be illustrated as follows: Dr. Fink ("Strategic Warfare," p. 63) argues the value of preferential defense through a specific scenario. A force of 150 ICBMs attacks a region of 50 cities defended with 100 (perfectly effective) area ABM interceptors. If the defense knows all 150 RVs are coming in an attack, and if the 150 are allocated evenly (3 per city), the ABM can preferentially chose to defend 33 of the cities (with 3 ABMs each), saving that number of cities from de-
and his staff that a logical method of programming "preferential defense" into the ABM command/control system could be devised. In addition, the OSD group had serious doubts about the political and ethical problems associated with judging the preferences necessary to institute such targeting. The Army appeared to accept the idea that value-ranking of targets could be accomplished in a straightforward manner, but Enthoven saw many problems both in making the choices and in defending their logic before interested groups such as the Congressional Armed Services Committees.

After considerable debate and analysis, Secretary Resor accepted the OSD view that "preferential defense," while an interesting concept, was better left out of operational ABM planning for the time being. On the first three major issues examined in the Army-OSD talks, there had been general accord: Consensus was possible regarding ABM system

struction. This shows the abstract value of preferential defense, in that the alternative of continuing to defend all 50 leaves but two ABMs per city (versus 3 RVs), thus resulting in destruction of all 50. However, Enthoven's question was this: What happens if the first enemy salvo contains only 100 ICBMs? Does the defense "go preferential" immediately? If so (with the enemy aiming 2 RVs per city), the 17 undefended cities are destroyed, while the defense uses 66 of its 100 interceptors to stop the 66 RVs aimed at the 33 preferentially-defended cities. The offense could then use its remaining 50 ICBMs to destroy 7-14 of the preferentially defended targets. Alternatively, the defense could decide (since only 100 ICBMs were observed) to attack all 100 RVs, thus allowing no damage in the first salvo. However, the enemy's second wave of 50 ICBMs would then receive a "free ride" and could destroy as many as all 50 of the cities. The question remained: At what point does the defense decide to let certain RVs detonate without attempting intercept?
performance in various scenarios, agreement was reached concerning
the analytic models used to assess nuclear exchange outcomes, and
the preferential defense idea was deemphasized as an operational
tactic for area defense systems. On the fourth, and perhaps most
crucial, point of debate--the arms race issue--between the two organ-
izations, however, no accommodation was reached. The exchanges be-
tween Enthoven and Resor, like those between McNamara and the members
of the Joint Chiefs, could not reach agreement on any sort of com-
promise on this issue, nor could one side convince the other to
abandon its view.

The arms race issue involved the "Soviet reaction" possibilities
which could follow any deployment of a U.S. ABM system. It was Sec-
retary McNamara's belief, and Dr. Enthoven concurred, that any Ameri-
can ABM deployment would, in light of the Soviet Union's own "assured
destruction" requirements, result in an offensive response by the
latter nation. OSD's position was that, while NIKE-X might provide
significant levels of protection versus current (1966) Soviet capabili-
ties, a Russian response to that U.S. ABM, in the form of more ICBMs,
MIRVs, sophisticated decoys, and/or their own ABM, would negate any
original benefit of the U.S. deployment. 59 The Army, with support
from the Joint Chiefs, disagreed, and provided two counterarguments.

59 McNamara had made this position explicit in both his 1965
Posture Statement (pp. 39, 62) and the 1966 Posture Statement (pp.
46, 54-56).
First, it was not obvious, Secretary Resor argued, that the Soviet Union would in fact make such a response to NIKE-X. The assumption that the U.S.S.R. too performed a U.S.-type "assured destruction" calculation was challenged, and Army officials noted that the economic and technical constraints operating on the Soviets could also curb any such response. In addition, the use of the action-reaction reasoning was challenged on more basic grounds. To Army officials like Secretary Resor and General Wheeler, there was neither logic to McNamara's argument nor any obvious reason to believe that the Soviets would respond to NIKE-X. The same unresolvable point of difference which had led McNamara in his 1966 Posture Statement to include both cases (Soviet response to NIKE-X or no response) in his damage limitation analysis remained at the center of the ABM debate.

**THE IMMINENT CONFRONTATION AND THE PRESIDENT'S DILEMMA**

In the five preceding budget processes, Robert McNamara had succeeded in securing the support (often tendered somewhat grudgingly) of the Joint Chiefs and the Department of the Army regarding ABM policy for the particular fiscal year involved. His arguments for deferral of deployment had emphasized three points which, because the objections could eventually be overturned by certain developments, could be accepted by military leaders. McNamara had asked

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60 Interview W. There was within the Army position a belief that, given the comparative resource advantage enjoyed by the J.S., it was desirable to force the Soviets into costly responses of the kinds predicted by McNamara. Interview A.

61 Ibid. See 1966 Posture Statement, pp. 53-54.
that production be delayed until R&D on system components demonstrated design feasibility through prototype testing. He had made fallout shelter expenditures a mandatory complement to NIKE-X, and he had insisted that an ABM deployment should be made only when and if developments in enemy strategic forces necessitated such a response.

By late 1966, however, support for the Army's ABM deployment plans had bypassed, if not overcome, most of the substance of these arguments. NIKE-X technology, including the still-to-be tested area defense interceptor, had reached a point at which many Defense Department scientists felt that the system could, if deployed as a thin area defense, provide effective protection in certain scenarios. The idea of small threats, when combined with the total area defense concept, also effectively deflated the fallout shelter argument: Many millions of shelter spaces had already been provided, and more important, area defense preempted the enemy's use of the "upwinc tactic." Finally, the defense community's uncertain knowledge of ongoing and apparently extensive Soviet air defense construction generated a feeling that, in answer to McNamara's third argument, enemy weapons developments did now necessitate U.S. action to deploy NIKE-X.

The extent to which ABM supporters had in fact answered McNamara's three objections remained a point of debate, but the impli-

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62 The technical performance issue was, as this study has shown in earlier chapters, dependant upon a number of assumptions concerning ABM system reliability, weapons effects, and enemy penetration tactics. The point to be made here is not that the technical problems were necessarily solved, but that NIKE-X supporters had gained as their allies key DDR&E and ARPA officials who backed the feasibility of a limited area defense. Likewise, uncertainty remained as to the nature of the Soviet's TALLiNN system, but this very uncertainty fueled the debate and lent credence to conservative estimates of that system's ABM potentials.
cations of the increasing strength of the pro-ABM arguments were clear. Deemphasis of the anti-deployment arguments discussed above forced the debate to focus upon the least tangible and yet potentially most important aspect of the ABM controversy, the "strategic instability" or "action-reaction" issue. Secretary McNamara was approaching the annual meeting with the President in which he and the various Chiefs of Staff made their final arguments on the budget. By November, 1966, it was obvious to the Secretary of Defense that this meeting would find him and Joint Chiefs split diametrically on the question of NIKE-X deployment and its relationship to the dynamics of U.S.-Soviet strategic arms competition.

The ability of Secretary McNamara to control the internal DOD debate on NIKE-X on his preferred terms appeared to be dissipating. For nine years, five of which found McNamara a central figure, the Defense Department had joined with non-Army technical experts (especially from PSAC and DDR&E) to counter Army requests for ABM deployment. The three Presidents involved, Eisenhower, Kennedy, and Johnson, had followed the advice of their Science Advisors and DOD experts, and had annually deferred missile defense production. There had always been debate as to the utility of a "heavy" anti-Soviet ABM, but this debate had historically focused on the question of technical feasibility. Throughout the NIKE-ZEUS era, defense scientists could argue that the system proposed by the Army simply would not work against large ICBM attacks.
Now, in 1966, this argument had undergone a major shift. Although many scientists outside the Defense Department did not agree, there was general technical consensus among military and DDR&E officials that NIKE-X could provide an interesting (if not major) reduction in U.S. damage if deployed against the current Soviet missile force. Still very much at issue was the question of whether or not the U.S.S.R. would respond to an American ABM by improving its offensive capability, and whether it was desirable to force the Soviets into such a position. The point of difference between military and civilian officials was no longer a primarily technical one, and the Joint Chiefs would not concede their position to OSD prior to arguing the matter before the President.

In previous years, the Chiefs had acceded to McNamara's deployment deferral decisions on both technical and strategic (evolution of the enemy threat) grounds. In late 1966, however, General Wheeler and his colleagues felt that the Secretary's position, based as it was not upon technical issues but upon the "action-reaction" argument, was open to serious challenge on the grounds of logic. For these generals, a Soviet response was not by any means a foregone conclusion, and even if such a reaction did evolve, it was seen as an economic and political victory for the United States. In addition, NIKE-X was but one means of asserting U.S. strategic superiority, a concept which the Chiefs credited as the key to American ability to deter nuclear war. Fortified by strong support from key Congressmen, the Chiefs were determined to take the issue to President Johnson, and they would make their case not in terms of the DDR&E-supported "thin" ABM, but in terms of the larger 25-city NIKE-X.
CHAPTER X

THE PRESIDENT'S DILEMMA: CONFLICTING ADVICE ON STRATEGIC DEFENSE

On November 2, 1966, President Johnson returned to the United States from a tour of Asian nations and went to the LBJ Ranch in Texas. Three days later, he met with Secretary McNamara and JCS Chairman Earle G. Wheeler for what was to be the first in a series of heated debates over a number of U.S. national security issues. While this meeting, and a second one held five days later, ostensibly dealt with the general form of the FY68 budget, two more specific matters dominated discussion. The NIKE-X deployment issue and the latest JCS requests for bombing authorization for a series of targets in the Hanoi area both faced the President.¹ At the November 10 meeting, the President deferred any action on the targets issue, but the press conference which followed that session indicated that the ABM deployment question had indeed been central in the deliberations.

In his remarks to the press at the ranch, McNamara publicly reaffirmed what had been known within the administration for some months: The Soviets were constructing an ABM system.² The Secretary had sensed,


²See "Transcript of Joint News Conference by President, McNamara, and Gen. Wheeler," New York Times, November 13, 1966. Two weeks prior to this meeting, another event had transpired which had implications for the ABM debate. On October 27, Communist China launched a prototype ballistic missile armed with an atomic warhead, thus showing visible signs of progress toward a nuclear ICBM force. See Michael
probably quite accurately, that it was only a matter of time before the just-completed NIE's conclusions regarding the MOSCOW ABM system were leaked to the public. By presenting the information on his own terms, he could preempt any effort by ABM supporters to drop this information as a sort of political "bomb" during the upcoming budget discussions with the President. McNamara's references to the Soviet defenses were of a moderate tone, and more emphasis was placed upon the response which the administration had selected than upon the Soviet's progress.

The Secretary stated that "the Soviet Union is taking [action] to initiate deployment" of an ABM, and that the U.S. would "assume it is effective" for purposes of reacting with improvements in American weaponry. The U.S. response was to recommend production and deployment of the POSEIDON missile force, a sophisticated submarine-based offensive system designed to penetrate even the most advanced ABM defenses. McNamara indicated that both anti-Soviet and anti-Chinese versions of the United States' own ABM, NIKE-X, had been discussed. His remarks showed that the ABM issue was far from settled, however:


3 See Hanson W. Baldwin, "A New Round Begins in the Battle of Sword," New York Times, November 27, 1966. As was discussed in Chapter Nine, there was real debate as to the ABM capabilities, if any, of the TALLINN system. McNamara's statement made no reference to this second Soviet system. For an example of the kind of interpretation of Soviet ABM developments which the Defense Secretary had sought to preempt, see George C. Wilson's accounting of the views of "Knowledgeable intelligence officials" in his "Arms Outdistancing Policy in Crim Race," Washington Post, November 18, 1966.

4 "Transcript of Joint News Conference..."
We concluded that it is much too early to make a decision for deployment against the Chinese threat and we have not arrived at a decision on any other deployment. We will continue our discussions on this subject in the weeks to come.\(^5\)

The Secretary was emphatic as he stated his view of the relationship between both the Chinese and Soviet threats and U.S. responses, through ABM deployment or otherwise:

One point I would like to stress to you is that the length of time required to deploy such a [U.S. ABM] system is less than the length of time required for the Chinese Communists to develop nuclear weapons that conceivably could threaten this nation. Therefore, it is not timely to at this time make a decision to deploy such a system to defend against the Chinese Communist threat....

There is absolutely no question about our capability of penetrating the Soviet defense with both our missiles and aircraft.... There was not any question about it when they erected the antiaircraft defenses and intended to prevent our bomber aircraft from penetrating. At that time, we had a capability of assuring bomber penetration. There is no question about it now when they are similarly trying to defend against intercontinental ballistic missiles.\(^6\)

The President flew to Washington for surgery the following week, returning to the ranch a few days later to recuperate. In the weeks between November 10 and early December, informed press sources indicated increasingly active pressure from key Congressional leaders to convince the President to act on the NIKE-X recommendations of the Joint Chiefs. The November 10 press conference had served two functions--it had confirmed in the minds of many observers the belief that Johnson had not yet himself made a choice on ABM,\(^7\) and it had

\(^5\)Ibid.

\(^6\)Ibid.

given the proponents of NIKE-X another specific item—the Soviet's ABM system—to add to their list of reasons why the U.S. should deploy similar weapons.

Since taking office, Lyndon Johnson had generally been able to leave the matter of strategic force planning and policy to his Secretary of Defense, and there is little to indicate that the President had ever taken a role other than that of reviewer regarding the ABM question. However, in late November and early December of 1966, NIKE-X loomed as a potential political issue of national magnitude, the kind of issue which demanded the attention of a President concerned with reelection in 1968. Certain Republicans had already seized upon the question as a potential campaign weapon, and the specter of another "missile gap," or more accurately, an "ABM gap," faced the Democratic administration. Within days after his landslide reelection as governor of Michigan, 1968 Presidential hopeful George Romney mentioned such a gap in a Meet the Press appearance on national television. Republican Senator Strom Thurmond, long time proponent of Army ABM systems, made similar remarks to the press.8

This rise in the political content of the issue tended to reduce the ABM deployment question to the basic level of "they have such a system, why don't we?" Congressmen on both sides of the aisle appeared to be viewing NIKE-X more and more in these terms, and

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through both direct communication and the press, their changing perspective became increasingly evident to the President. As the annual budget meeting of Johnson, McNamara, and the Chiefs approached, the tone of much of the press coverage of the ABM issue grew even more political, and the administration came to be pictured as saving dollars at the expense of lives and choosing a policy of bluff (the rather inelegant term used to summarize deterrence through offensive might) instead of an "effective" fighting or "surviving" strategy.

Refusal to accede to the JCS request would not by any means insure united Democratic support for the President, nor would deployment deflate the Republican's efforts to make a national issue out of the matter. On the Democratic side, Senate Armed Services Committee Chairman Richard Russell called for the administration to act on the NIKE-X deployment. If Johnson were again to refuse the Joint Chiefs on the matter, it was likely that Russell and his colleagues on that committee--many of whom were Democrats--would greet the

9It is impossible to assess here the extent to which this pressure was directly transmitted to the President by his former colleagues on Capitol Hill. This author's interviews with various administration officials support the interpretation that Johnson was indeed being reminded of the political liabilities associated with allowing the Republicans to use NIKE-X as Kennedy had used the "missile gap" in 1960. For public indications of the growing Congressional feelings on the ABM, see: Richard Fryklund, "How Pentagon Analyzes Missile Defense Problem," Washington Star, November 13, 1966; "U.S. Should Face Up to Red Missile Threats," (editorial), Kansas City Star, November 21, 1966; and George C. Wilson, "Missile Fight in Senate Is Expected," Washington Post, November 24, 1966.

President's budget in January in a decidedly belligerent mood.\footnote{Baltimore Sun staff reporter Henry L. Trewhitt appears to have had an accurate image, through his contacts with various Congressional sources, of the legislative mood of the time. For his analyses of the positions of Senator Russell and others, see his "Decision Due in Arms Race," Baltimore Sun, November 21, 1966, and "Pressures Mount for Anti-ICBM," Baltimore Sun, December 3, 1966. A few weeks later, House Armed Services Committee Chairman L. Mendel Rivers made a similar statement of support for NIKE-X. See Rudy Abramson, "Arms Race Brewing as U.S. Ponders Anti-Missile Plan," Los Angeles Times, December 25, 1966.}

For the Republicans, both a refusal to deploy and a decision to deploy implied political returns. The former decision yielded the "gap" issue, the latter alternative, dooming as it would any hope for a balanced FY68 budget, allowed for economic criticisms. Whatever his choice, President Johnson was forced by the fact of the McNamara-Joint Chiefs split to face the issue squarely as he examined his upcoming budget presentation.

CONFRONTATION AND COMPROMISE

On December 6, 1966, the President met with Secretary McNamara, Deputy Defense Secretary Cyrus Vance, General Wheeler and the other members of the Joint Chiefs of Staff, and Presidential advisor Walt Rostow. The meeting, held in Johnson's office in the federal building in Austin, Texas, saw the NIKE-X issue become the topic of a full-scale debate.\footnote{While this description of the December 6 meeting is based for the most part upon this author's interviews with certain government officials, a generally accurate account of those events has been published. See Robert Kleiman, "To Turn Down the Buildup," New York Times Book Review Magazine, September 8, 1968.} The Chiefs, citing recent intelligence on Soviet offensive and defensive buildups, unanimously argued that the U.S. should begin immediately to deploy the 25-city "Posture A" version of NIKE-X. General Wheeler and his colleagues made explicit their view that what was
ultimately needed was a missile defense similar to the even larger "Posture B" NIKE-X, and that intermediate levels of deployment were acceptable only if they represented just that: Intermediate steps toward an extensive defense. 13

The debate between McNamara and Vance on the one side and the Chiefs on the other quickly moved into discussion of the basic assumptions and objectives associated with alternative strategic nuclear policies. The Secretary contended that NIKE-X deployment would not add measurably to U.S. security, and that such an action would compel the Soviets to increase their offensive forces so that they would again be sufficient to devastate the United States. General Wheeler argued that NIKE-X was just the kind of weapon which would yield a reduction in the possibility of nuclear war through miscalculation, and would do so by demonstrating to the Soviet Union that the U.S. was determined to maintain an overwhelming strategic advantage. 14


14 A detailed statement of the JCS position is found in the transcripts of subsequent Congressional hearings. See especially Department of Defense Appropriations for FY68, Hearings held jointly before the Armed Services Committee and the Subcommittee on DOD Appropriations, U.S. Senate, 90th Cong., 1st Sess., January-February, 1967, pp. 249-252.
The issue was structured in terms of a familiar argument in American defense policy. The terms used to describe the alternative positions are "parity" versus "superiority." The Secretary was arguing that, for the U.S. and U.S.S.R., superiority was not an interesting concept because of the nations' mutual capacity to compete effectively in strategic arms races if they so desired. The Chiefs were saying that it was always prudent to seek military advantage, and that the enemy's ability to deny such advantage through equivalent response was not a foregone conclusion.\footnote{Ibid., and Kleiman, "To Turn Down the Buildup."} The confrontation in Austin was but a manifestation of this deeper debate on nuclear strategy, and the issue would not be resolved solely through a decision on NIKE-X.\footnote{For examples of the arguments made on both sides of the parity-superiority debate see (the parity view) George W. Rathjens, "The Future of the Strategic Arms Race; Options for the 1970's," Carnegie Endowment for International Peace, New York, 1969; and (the superiority view) the weekly "Washington Report," published by the American Security Council, a private organization with a major interest in U.S. defense policy.}
However, presentation of this plan publicly would be accompanied by two statements. First, it would be emphasized that the request did not commit the President to any specific timetable or type of deployment. Second, and most important to McNamara, the deployment option was to be made contingent upon an attempt to negotiate a possible mutual freeze in ABM deployment with the Soviet Union.\(^{17}\)

The plan reflected McNamara's increasing concern that steps should be taken to communicate properly to the U.S.S.R. the administration's feelings concerning strategic weapons expenditures. The Secretary felt that the Soviets had not fully comprehended the strategic ramifications of the kinds of offensive weapons advances (POSEIDON, MINUTEMAN III, and MIRVs) made or planned by the U.S. in response to Russian ABM developments. In addition, the preproduction funding and the talks aided the President on the domestic front. As one administration official was quoted as saying:

If the President did nothing more than continue development of the NIKE-X system, he could be crucified politically, and less than two years before the 1968 presidential election, for sitting on his hands while the Russians provide a defense for their people. But by spending a little preproduction money, he can't be accused of doing nothing. And if he fails to secure any agreement with the Russians, he can place the onus on them, should he decide to go ahead in this country.\(^{18}\)

President Johnson accepted the plan suggested by McNamara and Vance, and the Joint Chiefs gave their support, albeit unenthusiastically.

\(^{17}\)Ibid. (Kleiman). New York Times reporter William Beecher described, after interviewing "high Pentagon officials," the McNamara plan in accurate detail even before the December 6 meeting. This news story provides the most complete public account, in this author's view, of the compromise. See Beecher, "Johnson May Decide on Missile System," New York Times, December 2, 1966.

\(^{18}\)Ibid. (Beecher). Robert Kleiman's direct quotations from an interview with Robert McNamara provide numerous indications of the
As McNamara would later tell a reporter in January, he had "done his homework" on the political problems associated with the NIKE-X question. The President's consent to the negotiations concept was favorably looked upon by those who shared McNamara's view that the road to security was through arms control as opposed to continued weapons competition. It is evident, however, that the Secretary's primary concern was with those whose views on the matter mirrored those of the Joint Chiefs. In a brief press conference following the December 6 meeting, McNamara declined to discuss the specifics of the NIKE-X debate which had just transpired, but he did take time to read--without having been prompted by questioning he obviously anticipated--a lengthy prepared statement on the question of U.S.-Soviet strategic force relationships.

What the Secretary presented was a discussion of "the objectives of [U.S.] strategic nuclear forces, last year's estimates of the Soviet force, the way those estimates have changed, and the effect, if any, that that will have on our force planning." The presentation was a posture statement in miniature, a discussion of McNamara's perceptions of nuclear strategy. One point was emphasized throughout the statement: Because of OSD's use of the greater-than-expected threat in planning for potential future U.S. strategic weapons, America had not been caught short by recent Soviet advances in offensive extent of the Secretary's concern regarding the need to negotiate the ABM issue with the Soviet Union. See Kleiman, Ibid.


21 Ibid.
and defensive forces. As a result, the U.S.S.R.'s buildup in 1966 had in effect been countered already, through POSEIDON and MINUTEMAN III. While the Secretary did not say so in so many words, the implication was clear: Current intelligence on Soviet forces did not for McNamara constitute valid grounds for arguing for NIKE-X deployment.

**McNAMARA PREPARES FOR JANUARY WITH ACTION ON THREE FRONTS**

Returning to Washington from Austin the same day as the meeting, Secretary McNamara passed the President's instructions on to the State Department, and attempts to institute bilateral missile talks with the Soviet Union began immediately. Press accounts indicated that the U.S.S.R. was not altogether uninterested in U.S. ABM decisions, and stories circulated that Soviet diplomats were emphasizing that the Moscow ABM was experimental, and was not designed to be enlarged. The administration, apparently anxious to prod the as yet uncooperative Soviet Union into discussing a negotiation format, continued to leak information to the press concerning the State Department's efforts.

On December 19, 1966, these leaks changed to an open signal, as the White House publicly indicated (through background press information) that its pending deployment decision on NIKE-X depended in

\[22\text{Kleiman, "To Turn Down the Buildup."}\]

in turn upon the Soviet Union's willingness to agree to discuss strategic arms limitations. Two days later, Secretary of State Dean Rusk made this official as he told reporters that the U.S. sought "some means" to limit the arms race and thus avoid the "wholly new major levels of expenditure" that mutual ABM deployment entailed. Rusk expressed the same concern that McNamara felt—such expenditures would in the long run prove futile, because each nation could continually offset the other's gain.

It was apparent through all of these efforts that the United States had a very different image of strategic defensive weapons than did the Soviet Union. While the point about traditional Russian preoccupation with defense of the homeland seems to be overworked, there were numerous indications that Secretary McNamara's feelings concerning the strategic instability spurred by ABM deployments were not shared by the Soviets. Many interpretations, ranging from the "homeland" idea through statements about the political influence of the Soviet military, were offered as explanations of the Moscow ABM system. As the Johnson administration would later discover, however, perhaps the best interpretation was simply the observation that the


U.S.S.R. did not calculate scenarios for nuclear war as the Pentagon did. Instead of viewing its ABM as an integral part of some ongoing destruction/defense paradigm which governed the weapons acquisition policies of the two powers, the Kremlin may well have given only passing consideration to the arms race implications of its Moscow missile defense deployment. 26

In addition, there was some uncertainty as to just how U.S. diplomats had communicated the desire for ABM talks to the Soviets. Although later administration statements indicated acceptance of the idea that the issue should be discussed in conjunction with the entire strategic forces subject (i.e., including offensive systems), initial Soviet reaction (or lack of same) implies that the preliminary communications mentioned only defensive systems. 27 Such ground

26 American scientists who had participated in the Pugwash discussions of strategic weaponry with Soviet scientists were acutely aware of the gap between U.S. and Russian thinking on ABM systems. For the Soviet scientists, it was somehow irrational to talk of the "aggressive" nature of Russian ABM systems. These men saw the overwhelming U.S. offensive force as the aggressive threat, and pictured their nation's ABM as proper both in a military and a moral sense. McNamara's comments about the disutility of active defense and the arms race implications of such systems seemed hypocritical to the Soviets, who saw missile defense as a non-hostile and proper way to expend military budget resources. Interview Q. For alternative interpretations of the reasons underlying Soviet failure to respond favorably to U.S. efforts to negotiate the ABM question, see Gwertzman, "U.S. Aides in Quandry..."; Chalmers M. Roberts and Stephen S. Rosenfeld, "Soviet ABM: Two Impressions," Washington Post, December 18, 1966; and Rudy Abramson, "Arms Race Brewing...."

27 This interpretation is reinforced by the content of a press conference held by Soviet Premier Alexi Kosygin in London in February, in which the Premier implied a number of times that the U.S. had asked only for talks on ABM systems, and not on offensive forces. See Dana Adams Schmidt, "Kosygin Is Cool to Missile Curb," New York Times, February 10, 1967. See also Chalmers M. Roberts, "Nike Start May Depend on Russians," Washington Post, December 20, 1966.
rules were blatantly objectionable from the Russian viewpoint, because that nation's major concern in the nuclear weapons realm was the massive American strategic offensive force. It is possible, therefore, that Soviet coolness to McNamara's idea in December was due in part to the belief that the U.S. had in mind negotiating curbs on the Kremlin's ABM work while ignoring American buildups in offensive forces.

A second problem facing the administration as it prepared to present the FY68 budget was the political atmosphere in the Congress, an atmosphere which portended major legislative challenges to the President's programs, especially for NIKE-X. On the Republican side, the party's Congressional Policy Committee had decided to use the ABM issue as the major vehicle with which to challenge current U.S. policy toward the Soviet Union. Led by the ranking party member on the House DOD Appropriations Subcommittee, Melvin Laird, the Republicans began to question the President's approach to strategic weaponry. Congressional Democrats who championed NIKE-X also raised questions concerning the official administration position on ABM deployment. Washington Senator Henry Jackson, key member of both the Armed Services Committee and the Joint Committee on Atomic Energy, told newsmen that McNamara's

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28This author's interviews with Johnson administration officials indicated the widespread presence of the feeling that the Congress was preparing to roast the President for failure to initiate ABM deployment.

29Robert S. Allen and Paul Scott, "GOP Challenge on Anti-Missile Plan," Oakland Tribune, January 10, 1967. Laird phrased the issue in terms of superiority versus parity, and said that the administration's current policies "gravely endangered the safety of the nation."
estimates for Chinese ICBM capability were five years off, and that the threat would evolve much earlier. 30

The President, well attuned to the prevailing mood of the Congress, appeared to be in need of reinforcement himself regarding the direction he had taken on NIKE-X. Secretary McNamara had already followed up his December 6 opposition to the JCS plan for an anti-Soviet ABM by presenting the President with a specially-prepared Draft Presidential Memorandum on alternative NIKE-X deployment configurations. The DPM argued that anti-Soviet versions of the ABM were doomed to ineffectiveness, but suggested that a very thin area defense could provide a useful shield against the expected Chinese threat. 31 In an effort to reinforce in President Johnson's mind the idea that the JCS-favored levels of NIKE-X would be futile expenditures, the Secretary of Defense took yet another step.

In early January, 1967, McNamara invited to the White House the seven men who were past or present occupants of the posts of Special Assistant to the President for Science and Technology and Director of Defense Research and Engineering. Doctors Killian, Kistiakowsky, Wiesner, Hornig, York, Brown, and Foster unanimously supported McNamara's view that the Chiefs' large-scale NIKE-X plan was not a prudent

30 "Senator Warns of A-Threat from China," Philadelphia Bulletin, January 12, 1967. In fact, there appears to have been no real difference between Jackson's and McNamara's estimates. Jackson's 1970-72 date referred to China's attainment of an ICBM, i.e., a prototype. McNamará's 1975 date was the one used by OSD and the JCS to refer to a "significant" (more than 20-30 missiles) operational ICBM capability.

31 Interview R, Interview Y.
policy choice. With this advice in hand, the President and his Defense Secretary began to formulate the specific wording and argument concerning ABM policy as it would appear in the three major policy statements which the administration was about to present, i.e. the President's State of the Union Address, his annual budget message, and the OSD annual Posture Statement.

THE ADMINISTRATION PREPARES FOR DEBATE

The approach to NIKE-X which the President had selected necessitated that the administration communicate its arguments to three different audiences, each of which would hopefully accept the specific form of McNamara's plan. It fell to the Secretary of Defense himself to conduct this information effort, an effort addressed primarily to (a) the Soviet Union, (b) the strong NIKE-X deployment advocates in the Congress, and (c) the large group of Americans, led by members of the scientific community, who sought immediate curbs on strategic weapons expenditures. The President's State of the Union message provided the first formal medium through which to conduct the campaign, and this speech—to which McNamara contributed—spoke both to the U.S.S.R. and to the Congress.

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Interview BB. Interview Y. General Earle Wheeler, who also attended the meeting, was quoted by two of this author's interviewees as having commented as to the "stacked" nature of the group. It was obvious to all involved that among the seven men were some of the most vocal critics of ABM systems that had served in the Eisenhower and Kennedy administrations.
Delivered on January 10, 1967, the address noted the existence of the Moscow ABM system and stressed the common interest of the two great nations in slowing down arms races of the type associated with such weaponry. Without being specific as to the type of agreements he sought, Johnson told the Congressmen that he would soon seek their advice concerning "the possibilities of international agreements bearing directly upon this problem." Implicit too in the President's statement was the threat to the Soviets that, if they did not wish to participate in such agreements, they could anticipate U.S. weapons acquisition decisions, including NIKE-X deployment, which would negate any U.S.S.R. attempt to alter significantly current strategic force relationships between the two states.

Two weeks later, the administration presented the two annual statements which specifically outlined U.S. policy on the ABM issue. The President's presentation of the FY68 budget to the Congress and Secretary McNamara's Posture Statement both reflected the extent to which the Defense Secretary's December 6 compromise ABM plan had been implemented. The budget statement included points directed at each of the three audiences mentioned above. For those who called for immediate NIKE-X funding, some $375 million for potential ABM production initiation was included in the FY68 budget. ABM opponents

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were perhaps heartened by the statement that there would be "no action now to deploy" NIKE-X, but a further warning to the Soviets indicated that this was only a deferral: "In the event the discussions [with the U.S.S.R.] prove unsuccessful, we will reconsider our deployment decision." This statement, which was personally written by Secretary McNamara, purposely avoided any elaboration as to the specific type of NIKE-X configuration contemplated. It did cite one possible role for ABM: Defense of U.S. strategic offensive forces.

As he had done in the past, the Secretary of Defense used his annual Posture Statement to discuss in detail the nature of and rationale behind U.S. decisions in national security policy. The format of the strategic forces presentation was little changed from the previous two years' statements. It is interesting to review briefly, however, the manner in which McNamara chose to treat the NIKE-X issue in the context of his Assured Destruction and Damage Limitation analyses. Although the Army and its supporters on NIKE-X showed little enthusiasm for such a concept, the Secretary described the possible value of ABM systems in the Assured Destruction role, i.e., as defenders of American land-based strategic missile forces. He indicated that, in conjunction with the GTE threat planning exercises in OSD, that type of ABM deployment had been examined as a


possible substitute for further expansion of the offensive forces. 37

The Damage Limitation presentation's treatment of NIKE-X was a detailed counterargument to the JCS rationale for ABM deployment. In introducing his strategic forces discussion, McNamara had warned of the futility he perceived in any major U.S. or Russian attempt to limit damage significantly and described the President's decision to defer any ABM deployment pending the results of attempts to negotiate strategic arms limitations with the Soviet Union. 38

The Secretary then drew three conclusions associated with the administration's decision not to initiate NIKE-X deployment, and each

37 "Statement of Secretary of Defense Robert S. McNamara On the Fiscal Year, 1968-72 Defense Program and 1968 Defense Budget," (mimeo.), January 23, 1967. Hereafter referred to as 1967 Posture Statement. See p. 45. McNamara's analysis of the assured destruction role took into account the enlarged Soviet counterforce potential ability to intercept U.S. ICBMs implied by current or planned Russian ABM systems. OSD's response was a major funding package which included production and deployment of POSEIDON, MINUTEMAN III, and advanced penetration aids, plus initiation of development of even more sophisticated pen aids, including MIRVs. (See p. 44).

38 Ibid., p. 40. The Secretary indicated that the Moscow ABM system was a limited deployment, and that "the weight of evidence" suggested that the TALLINN system was "not intended primarily for anti-ballistic missile defense." (p. 42.) The internal DOD debate on TALLINN had not been resolved, however, and DIA and the Joint Chiefs continued to view that system as an ABM. The differences between OSD and the JCS were unusual, though, in that most technical observers felt that TALLINN's radars were incapable of interesting ABM performance. The JCS could not conceive of any major military need for a new Soviet bomber defense in light of U.S. deemphasis of the B-52 force, and thus concluded that--regardless of this technical skepticism--TALLINN had to be an ABM. For discussion of the continuing debate, see George C. Wilson, "Joint Chiefs Challenge Stand on Anti-Missiles," Washington Post, February 22, 1967; Henry L. Trewhitt, "Disagreement Between Joint Chiefs of Staff and McNamara is Admitted"; and "ICBM Defense Danger to U.S.: Wheeler," Chicago Tribune, February 27, 1967.
of the three was in opposition to the position taken by General Wheeler and the JCS. First, the Soviets would in McNamara's view be forced to react to a U.S. ABM with an offensive buildup. Second, this would mean that the risk of a Soviet nuclear attack on the United States would not be further decreased, and third, should such an attack occur, damage to the U.S. "would not be reduced in any meaningful sense." 39

So as to illustrate a major part of the OSD-JCS differences on the utility of NIKE-X, the Posture Statement again presented (as it had in 1966) a dual analysis of U.S. and Soviet fatalities under different scenario assumptions. The first analysis, the JCS-preferred version, assumed no major Soviet strategic force improvements in reaction to NIKE-X deployment by the U.S. The second case, McNamara's preferred analysis, assumed Soviet increases in the damage potential of their offensive force in response to NIKE-X. Two U.S. ABM configurations were used, the 25-city, $12.2 billion "Posture A" recommended to Johnson by the Joint Chiefs, and the expanded 50-city, $21.7 billion "Posture B," which represented the Army's long-term deployment goal. 40 Assuming a Soviet first strike,


40 Ibid., pp. 48, 49, 51. McNamara included in these two postures some $2.4 billion for other damage limiting systems (anti-aircraft defense). He also expressed the belief that even the 50-city system was a politically unstable level of deployment, and that clamoring by cities not afforded SPRINT protection (even though both Postures A and B contemplated total coverage through the recently developed area defense) would lead to more batteries, ultimately requiring an expenditure on the order of $40 billion over ten years. See p. 48.
the figures appeared as follows (fatalities listed in millions of lives):

<table>
<thead>
<tr>
<th>U.S. PROGRAMS</th>
<th>ASSUMES NO SOVIET REACTION</th>
<th>ASSUMES SOVIET REACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U.S. FATALITIES</td>
<td>SOVIET FATALITIES</td>
</tr>
<tr>
<td>APPROVED (NO ABM)</td>
<td>120</td>
<td>120+</td>
</tr>
<tr>
<td>POSTURE A</td>
<td>40</td>
<td>120+</td>
</tr>
<tr>
<td>POSTURE B</td>
<td>30</td>
<td>120+</td>
</tr>
</tbody>
</table>

Noting that his assumed Soviet reaction returned U.S. fatalities to original (pre-NIKE-X) levels, McNamara stated his assessment of the value of an anti-Soviet ABM system for the United States:

The Soviets have it within their technical and economic capacity to offset any further Damage Limiting measures we might undertake, provided they are determined to maintain their deterrent against us. It is the virtual certainty that the Soviets will act to maintain their deterrent which casts such grave doubts on the advisability of our deploying the NIKE-X system for the protection of our cities against the kind of heavy, sophisticated missile attack they could launch in the 1970s. In all probability, all we would accomplish would be to increase greatly both their defense expenditures and ours without any gain in real security to either side.  

41 Ibid., pp. 52-53. In an obvious move designed to communicate to the Soviet Union, McNamara's presentation also included similar data for a U.S. first strike. In each case, the U.S.S.R. suffered fewer casualties if the U.S. struck first. The message was clear: The U.S.S.R. was being warned that the most foolish of all options available to that nation would be to initiate a nuclear exchange. McNamara was able to arrive at such an analysis in this manner: If the U.S. launched a first strike, it would allocate a major portion of its offensive force against Soviet offensive weapons (many of which could presumably be caught on the ground) in an effort to limit damage to the U.S. The result would be fewer U.S. warheads on Russian cities, thus fewer Soviet casualties. Alternatively, a Soviet first strike meant that few Russian offensive weapons would remain behind, thus there were fewer counterforce targets available to the U.S. second strike force. Many more U.S. weapons could therefore be allocated against the Soviet population. Even considering the potential reduction in the U.S. response owing to Soviet counterforce targeting, the calculations yielded higher Russian fatalities in this second case.

42 Ibid. (Emphasis in original.)
The Secretary's assessment of U.S. missile defense possibilities against the Chinese nuclear threat was much less critical of NIKE-X than was the above analysis. The text made reference to the potential "high degree of protection" which might be afforded by a thin area defense. In a major downward shift in systems costs compared to his 1966 presentation, McNamara set the total cost of a thin defense against China at $3.5 billion.\textsuperscript{43} Data presented for two possible levels of Chinese ICBM threats indicated that the small U.S. ABM "could probably preclude damage in the 1970s almost entirely," and could be augmented in later years to maintain such a capability against the evolving Chinese threat.\textsuperscript{44}

After noting that deployment of an ABM against the Chinese could safely be delayed so long as NIKE-X's lead time was shorter than that of China's ICBM force, the Secretary repeated almost verbatim the administration's FY68 ABM policy presented by President Johnson in his budget message: NIKE-X R&D would continue, no deployment would be initiated pending arms talks with the U.S.S.R., and some $375 million was included in the budget so as to allow the administration to reconsider production of such a defense in FY1968 should these

\textsuperscript{43}The 1966 Posture Statement's "thin" anti-China systems had been much larger ($10-20 billion) deployments which made extensive use of SPRINT missiles. The 1967 version, however, used few SPRINTS (to protect the PARs), and relied primarily on the area defense missile (DMLX2), officially named SPARTAN in January, 1967. See "Spartan is Name for New Nike-Zeus Missile," Missile & Space Daily, January 5, 1967. The original Army name suggestion had been "MARATHON," but the slur at the extended length of time that the service's ABM system had been relegated to the development and testing stages was too obvious.

\textsuperscript{44}1967 Posture Statement, p. 54. For a small Chinese ICBM force, U.S. population damage was set at "zero plus," and for an enemy force three times that large, at one million fatalities. (No specific numbers were cited for the numbers of Chinese missiles, only "x" and "3x." )
negotiations prove fruitless. McNamara had formulated the President's case, and now faced the task of convincing his three audiences to accept the administration's decisions. OSD officials had anticipated a hostile response from the Congress concerning NIKE-X, and, although the insertion of the $375 million fund in the budget seemingly took some of the fight out of the legislators, the Secretary was nonetheless greeted by a group of angry inquisitors in the various military budget hearings.

CONGRESS AND NIKE-X: A DELICATE TRUCE

Central to the discussions of NIKE-X which took place in each of the three defense-related legislative hearings was the presentation of the specific differences on the issue between McNamara and the Joint Chiefs of Staff. General Wheeler accompanied the Secretary to each of the sessions, and followed McNamara's posture testimony with the JCS assessment of the ABM question. As described above, the Secretary's view was that Soviet response (through offensive buildup) to NIKE-X would be both inevitable and undesirable--inevitable because the U.S. threatened the Soviets' deterrence calculation, undesirable because such a general increase in the numbers of strategic weapons implied a heightened risk of war with no net gain in security for either nation.

General Wheeler told each of the hearings that the Chiefs supported the Army's "Posture A" deployment, and he elaborated the JCS view of the strategic situation as it related to NIKE-X. Wheeler listed four reasons why the Chiefs believed the U.S.S.R. had initiated a major buildup in strategic forces:

First, to reduce the United States assured destruction capability—that is, our ability to destroy their industry and their people.

Second, to complicate the targeting problem which we have in directing our strategic forces against the Soviet Union.

Third, to reduce U.S. confidence in our ability to penetrate Soviet defenses, thereby reducing the possibility that the United States would undertake a preemptive first strike against the Soviet Union, even under extreme provocation.

Fourth, to achieve an exploitable capability, permitting them freedom to pursue their national aims at conflict levels less than general nuclear war. 47

This fourth point went to the heart of the generals' concern regarding Soviet ABM progress. The Chiefs wished to maintain a clear superiority in strategic forces over the U.S.S.R., and the expansion of the Moscow ABM threatened their confidence in the current power relationship between the two nations. They saw the existing situation—Soviets with an ABM and U.S. without one—as the source of "grave uncertainties associated with targeting" for the United States. 48

Wheeler also felt that the absence of an American ABM weakened our deterrent—American nuclear superiority had to be unmistakable:

47 DOD Appropriations for 1968 (House), Part II, p. 177.
48 Ibid., p. 178.
Failure to deploy a U.S. ABM creates a strategic imbalance both within our forces and between the United States and the Soviet forces. It could lead to Soviet and allied belief that we are interested only in the offensive, that is a first strike, or that our technology is deficient, or that we will not pay to maintain strategic superiority. 49

By deploying the "Posture A" version of NIKE-X, the Joint Chiefs sought to reverse the gains which they perceived the Soviets to have made through that nation's own ABM. In Wheeler's words:

Specifically, we believe that deployed NIKE-X would do one or more of the following. First, provide a damage limitation capability by attrition of a Soviet attack. Second, introduce uncertainties which would inhibit Soviet leaders from concluding that the United States could not survive a Soviet first strike or that the United States would not preempt under any circumstances. Third, stabilize the nuclear balance. Fourth, demonstrate to the Soviets and our allies that the United States is not first-strike minded; in other words, that we don't put all our eggs in the offensive basket. Fifth, continue to deny to the Soviets an exploitable capability. By this I mean to continue the Cuba power environment in the world. 50

As for Soviet reactions to NIKE-X, Wheeler indicated that the Chiefs disagreed with McNamara in two senses. First, they did not believe that there was any good reason to assume, as OSD did, that the U.S.S.R. would respond to an ABM just as the U.S. responded to Soviet defenses. Secondly, even if such a response was initiated, it was to the United States' advantage in that it strained the economy and technical capabilities of the U.S.S.R. and diverted resources "from other high

49 Ibid.
50 Ibid., p. 179. While the General did not define what he meant by "nuclear balance," the point appears to have referred to reciprocal force capabilities, i.e. balance means that a Soviet ABM requires a U.S. ABM deployment, not an offensive response as argued by McNamara (see p. 196). The "Cuba" argument derived from the conclusion that Soviet withdrawal of their missile deployed in Cuba in 1962 was basically the result of overwhelming U.S. nuclear superiority.
priority programs.\textsuperscript{51}

Other officials testifying on NIKE-X generally gave the kinds of answers which past portions of the ABM debate would lead one to expect. Army Chief of Staff General Harold K. Johnson indicated that he still supported the JCS view calling for the Posture A deployment, and stressed the strength of his disagreement with McNamara on the issue. He argued that the recent Soviet advances had left the U.S. behind, and that the administration's refusal to proceed with NIKE-X left him very uncomfortable.\textsuperscript{52} Air Force Chief of Staff General John P. McConnell also supported the JCS position, but indicated two beliefs which distinguished his stand from that of General Johnson. First, McConnell commented that his support of Posture A was contingent upon Army modification of that deployment plan to include hardpoint defense of Air Force MINUTEMAN forces. Second, he made two statements which placed him somewhat more in harmony with DDR&E than with the rest of the Chiefs. The Air Force general showed his preference for area defense and less-than-massive NIKE-X configurations:

I would rather have the MINUTEMAN complexes defended before we decide we are going to defend a certain number of cities. I think we ought to develop an area defense which would give defense to everybody to some extent against a reasonable attack.... I agree with the Secretary of Defense, and I believe the JCS also agrees, that if they [the U.S.S.R.] lay down a massive attack, there is no defensive system in the world that can keep a sufficient number of their missiles from penetrating and doing us irreparable harm.\textsuperscript{53}

\textsuperscript{51}Department of Defense Appropriations for FY68 (Senate), p. 250.

\textsuperscript{52}See DOD Appropriations for 1968 (House), Part II, p. 636. Johnson was supported by his R&D director, General Betts. See p. 654.

\textsuperscript{53}Ibid., p. 773. The Chief of Naval Operations, Admiral David L. McDonald, and Marine Commandant Wallace M. Greene, did not elaborate
The three civilian service secretaries presented yet another set of opinions on the matter for the Congress. Army Secretary Stanley Resor, after voicing support for the official administration policies, described his deployment preference—should the arms negotiations fail—as being a limited area defense plus the hardpoint MINUTEMAN defense. Unlike the military men in the Department, Resor did not view NIKE-X as a useful option to exercise versus the Soviet threat. Navy Secretary Paul Nitze basically agreed with Resor, and stressed the utility of a "thin" system:

My view is that we might be well advised to initiate a light deployment of an antiballistic missile subject to the results of proposed negotiations with the Soviet Union.... You can learn...by building a light one, and in my view the advantages of a light defense as against any threats that might come from Communist China could warrant so doing.55

Air Force Secretary Harold Brown supported McNamara's view concerning the futility of an anti-Soviet ABM, but saw advantages to a smaller kind of NIKE-X deployment:

It is a lot easier to defend missiles than to defend people. In my opinion, [hardpoint MINUTEMAN defense], plus a thin population defense is the maximum which is really worth doing.... If you are planning to put in an area defense of the population, which would be, say, a $3.5 billion expenditure, then the additional expenditures required to defend the missile complex to a reasonable degree of protection is somewhere between a half billion and a billion dollars...."56

their views on the NIKE-X subject beyond voicing their agreement with General Wheeler's testimony. See p. 909.

54 Ibid., p. 635. General Johnson followed the Army Secretary with a statement which disagreed with Resor's stand.
55 Ibid., p. 909.
Each of the service secretaries had supported the kind of system which had been favored by many civilian DOD scientists since 1966. DDR&E head John Foster, a leading advocate of the "thin" area ABM, presented three arguments for such a deployment to the Congressmen. To defend the entire U.S. against the Communist Chinese, to intercept any accidental launch, and to insure the continued deterrent status of the MINUTEMAN force, Foster advocated the $4-5 billion system mentioned above by Secretary Brown. The hearings had brought forth a spectrum of opinion on NIKE-X ranging from McNamara's opposition to any level of ABM deployment in the near future, through the "thin" system advocacy of Foster and the civilian service secretaries, to the official JCS support of Posture A.

The administration had made its case, but the Congress' mood indicated that only the possibility of negotiations with the Soviet Union kept many legislators from openly and vigorously challenging what they viewed as foot-dragging by President Johnson and Secretary McNamara concerning NIKE-X. The President's own personal commitment to such arms talks became more evident, and reinforced McNamara's deep feeling that the U.S. should not initiate another strategic arms buildup by constructing an anti-Soviet ABM. In direct contrast to Johnson's and McNamara's attitudes regarding strategic

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57 DOD Appropriations for FY68 (Senate), p. 525.

policy, the Republican National Committee criticized current U.S. policy as "lagging" in its efforts to defend the American people. At the core of this argument was the kind of fear which had been a factor in many people's opposition to the Nuclear Test Ban Treaty in 1963: If the Soviets do show any inclination to negotiate a freeze on ABM deployment, it must be because the Kremlin believes such a freeze would yield a major advantage over the United States.  

THE SOVIET UNION AND ARMS TALKS: DISAPPOINTMENT FOR THE ADMINISTRATION

While the Congress did not make any attempt to repeat its 1966 efforts to direct the President to deploy NIKE-X, the Senate Armed Services Committee perhaps best captured the mood of the legislators in its March statement on ABM systems. In his committee's authorization bill report to the full Senate, Senator Richard Russell included a paper favoring deployment of NIKE-X unless the negotiations with the U.S.S.R. resulted in an acceptable arms agreement "within a reasonable period." McNamara's "defer ABM while we negotiate" plan had seemingly prevented a major political battle over NIKE-X in January, but the administration's inability to commence serious substantive discussions with the Soviets threatened the major barrier which the President maintained between himself and a production go-ahead on the Army's program.


The chronology of U.S.-Soviet discussions on missile defense in 1967 shows little to indicate serious Kremlin desire to negotiate the matter on American terms, i.e., emphasizing curbs on ABM systems over limitations on offensive systems. The administration's early efforts at direct diplomatic communications regarding substantive talks met with either noncommittal or negative responses from the U.S.S.R. U.S. Ambassador to Moscow Llewellyn Thompson delivered the President's personal note on the subject to Premier Kosygin on January 11, 1967, but there were no public indications of Soviet willingness to negotiate.61 A few weeks later, the State Department undertook a series of talks with Soviet ambassador to the U.S. Anatoly F. Dobrynin in Washington, but again, there was little to indicate that the U.S.S.R. was interested in negotiations on the President's terms.62

In February, the events surrounding the U.S.-Soviet negotiations efforts illustrated internal difficulties on the part of both nations. Premier Kosygin apparently perceived American intentions as seeking a missile defense freeze without corresponding limitation on offensive systems. In a London press conference on February 9, he challenged this U.S. view of strategic weapons and arms race instability: "What heightens military tension in the world more: an offensive or a

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defensive system? A system that serves to ward off an attack [i.e., an ABM] does not heighten the tension but serves to lessen the possibility of an attack that may kill large numbers of people."63 Pravda, in reporting the Premier's remarks, said that the Soviet Union was ready to negotiate arms limitations with the U.S. This news account was quickly discredited by Moscow, and the Soviet government, apparently embarrassed by the story, said it had "no interest" in an ABM moratorium.64

This incident seemed to have had its impact upon the United States government, and especially upon Secretary McNamara. The Defense Secretary's preoccupation with the concept of ABM-generated arms instability seemed to have led him to discount Soviet fears of recent U.S. offensive force improvements or planned increases such as MIRVs, POSEIDON, and MINUTEMAN III. Kosygin's heated criticism of the idea of "ABM-only" talks brought forth from McNamara the observation that any discussions might in fact have to be extended to include offensive as well as defensive systems.65 At the same time that U.S. officials were reexamining their previous communications with the Soviets, Moscow leaders were making statements which indicated the degree to which the two nations lacked understanding of each other's perceptions of nuclear war and strategy.

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63 Dana Adams Schmidt, "Kosygin is Cool to Missile Curb," New York Times, February 10, 1967. It is important to recall too that the U.S. bombing of North Vietnam was a major Soviet concern, and the Kremlin seems to have felt that termination of such attack might represent a proper Soviet prerequisite to any substantive arms talks.
65 See McNamara's remarks in a British television interview in "McNamara Says Arms Talks May Be Extended," St. Louis Post Dispatch,
While the Johnson administration began to realize that its view of the strategic instability of ABM deployments was not shared by the Kremlin, the Soviets themselves acted to modify the nature of their response to the U.S. position. The remarks of certain Soviet officials aside, Moscow made it clear that they opposed an ABM moratorium not because the U.S.S.R. had perfected such defenses and wanted to retain them, but because they felt the truly destabilizing factor in the strategic arms race to be the rapid improvements in the offensive forces of the United States. These reexaminations by both nations of the issues involved did yield some grounds for optimism concerning arms talks, but weeks and months passed with no real substantive progress.

February 21, 1967. Throughout this period it is unclear what the role played by the ongoing Geneva disarmament talks was in relation to the U.S. desire for ABM limits. The Geneva forum had examined both offense and defense, and the administration's lack of reference to those negotiations seems to have confused the U.S.S.R.

Soviet Deputy Defense Minister Paval Batitsky and General P.G. Kurochkin had used the occasion of the 49th anniversary of the Soviet Army to claim that the U.S.S.R.'s air defense provided an essentially impenetrable shield against U.S. ICBMs. "Russia Says It Can Down U.S. Missiles," Baltimore Sun, February 21, 1967. Two days later, however, two higher-ranking Soviet officials, Marshal Andrei Grechko and Marshal Vasily Chuikov, conceded that their nation's ABM defense was not an impenetrable system. In Chuikov's words, "Unfortunately, there are no means yet that would guarantee the complete security of our cities and most important objectives from the blows of the enemy's weapons of mass destruction." See Raymond H. Anderson, "Russians Concede Missile Net Flaw," New York Times, February 23, 1967.
In early March, the Kremlin indicated that the U.S.S.R. was willing to discuss ground rules for later talks, but subsequent discussions in Moscow between U.S. ambassador Llewellyn Thompson and Soviet officials made little progress toward establishing substantive negotiations. By mid-May, U.S. officials generally conceded that the likelihood of meaningful talks was essentially nil in the short run. The Johnson administration had five months of essentially futile negotiation attempts to show for its efforts, and the President could well have begun to feel the pressures inherent in his own budget message. He had promised a reconsideration of the NIKE-X deployment decision in the event arms talks with the Soviet Union proved unfruitful. There was little optimism concerning attainment of substantive talks themselves, let alone agreements to curb strategic weapons production.

THE ROAD TO GLASSBORO: TIME RUNS OUT FOR JOHNSON AND McNAMARA

Robert McNamara continued to view U.S. deployment of any type of ABM system as an undesirable first step toward what he perceived to be a futile and dangerous new round of U.S.-Soviet arms competition. Although President Johnson shared his Defense Secretary's concern regarding the arms race implications of NIKE-X, the chief executive was also worried about the domestic political ramifications of

continued administration refusal to approve an ABM deployment of some kind. Thus, while he supported McNamara's commitment to arms talks, the President had observed many factors in early 1967 which made him lean toward taking some positive action to answer his pro-ABM critics.

McNamara too indicated that perhaps a more feasible--from a domestic political standpoint--approach to the matter than the previous attempt to prevent U.S. ABM deployment would be for both the United States and the Soviet Union to agree to limit the size of such defenses to "thin" or small deployments. Because he believed such small systems could be rationalized as insignificant vis-à-vis U.S.-Soviet strategic relationships, and because he accepted the fact that the President might decide to undertake ABM deployment for political reasons, McNamara began to sound somewhat less pessimistic concerning the value of small levels of missile defense.68 Both the "anti-Chinese" and the hardpoint MINUTEMAN defense had been mentioned as missions for thin ABM deployments, and the Secretary had by early June stopped citing the lead time argument as a barrier to initiation of a defense designed for the China threat.

The administration had managed to resist Congressional pressures for NIKE-X through May of 1967, but the events of the following month would cast a new perspective on the issue for President Johnson. The Arab-Israeli war in early June heightened general world tensions and

prompted Soviet Premier Kosygin to announce a visit to the United Nations. The Premier's purpose was to assist in the Arab efforts to denounced Israel and demand that nation's withdrawal from occupied territories. Although he appeared somewhat reluctant, Johnson offered to meet with Kosygin to discuss world affairs.\footnote{The two men had not met before, but the Mideast conflict made both leery of a confrontation at that particular time. See Max Frankel, "Johnson Willing to Meet Kosygin," \textit{New York Times}, June 16, 1967.} Within days of the U.S. President's offer, yet another event touched off a major domestic attack on the Johnson administration, an attack which brought NIKE-X to the center of national policy concern.

On June 17, the Communist Chinese detonated their first hydrogen bomb, and Congressional response to this technological feat was both rapid and specific. Calling for an immediate start of NIKE-X deployment, Senator Richard Russell took an obvious stab at McNamara, saying that "it is deplorable that, in this country, the will of one man should override those of all the men who have been trained to protect the national security," and that it was a "dream of a dreamer who dreamt a dream" to believe that the U.S.S.R. would agree to verifiable arms limits.\footnote{Quoted in Charles W. Corddry, "China Bomb Test Expected to Cut Nike-X Resistance," \textit{Baltimore Sun}, June 20, 1967.} House Armed Services Committee Chairman L. Mendel Rivers also asked Johnson to deploy NIKE-X, arguing that the nation could not wait "for the decision of those who fiddled while America could burn." Joint Committee on Atomic Energy members Senator Henry Jackson and Representative Craig Hosmer backed the two Armed Service

As he faced this heated criticism from members of the Congress, the President simultaneously attempted to arrange his planned meeting with Premier Kosygin. The Mideast issue and the nuclear proliferation problem were topical candidates for that discussion, and Secretary McNamara sought the Soviet leader's ear on the ABM question. Since early spring, the Defense Secretary had hoped to visit Moscow personally for pre-negotiation talks. If the Soviets refused McNamara himself, he was prepared to send his Assistant Secretary for International Security Affairs, John McNaughton.\footnote{See Kleiman, "To Turn Down the Buildup," New York Times Book Review Magazine, September 8, 1968, Section 7. Kleiman documents McNamara's feelings and efforts through interviews with both McNaughton and the Secretary himself.} After months of waiting for the Kremlin invitation which never came, McNamara took the opportunity of the Johnson-Kosygin talks to communicate his feelings to the Soviet leader.

After extended and apparently delicate debate as to where the two leaders would meet, the summit talks took place at Glassboro, New Jersey, on June 23 and 25. At a luncheon meeting on Friday, June 23, Johnson convinced Kosygin to listen to McNamara concerning the strategic arms issue. The Premier heard the Defense Secretary present a frank and impassioned analysis of current Soviet and U.S. offensive capabilities and potentials for enlarging those forces. McNamara
argued that Soviet continuance of its ABM construction program would force the United States to build an even stronger offensive force, and could also lead to a similar ABM deployment in America. Whatever the specific course of this action-reaction cycle, the Secretary saw both nations expending valuable resources without realizing any meaningful gain in security in the long run. 73

The President and McNamara, both realizing the potential political ramifications of a failure to initiate negotiations, appeared to have high hopes that the Secretary's plea to Kosygin would result in Soviet acceptance of a format for arms talks. On Friday and again on Sunday, however, the Premier indicated that he simply did not consider ABM—or any—defensive—deployment as representing any threat to a potential enemy. At one point calling McNamara an "immoral capitalist," Kosygin scored U.S. offensive weapons policy as the real threat to the world. 74 The kind of "assured destruction" view which made Soviet defenses so destabilizing to McNamara simply did not interest the Soviet leader. Just as the U.S. felt forced to respond to the U.S.S.R.'s defenses by increasing its offensive forces, this response led the Soviets to commit resources to strategic defense. At Glassboro, each side was accusing the other of instigating a reciprocal process which was to each nation both undesirable yet inevitable, given the opponent's insistence upon participating in the "race."


74 Ibid. (Kleiman).
Returning to New York on June 25, Kosygin repeated to a United Nations press conference essentially the same points he had communicated to Johnson and McNamara in their meetings. The Soviet Union, he said, could see neither urgency nor basic utility in negotiating the ABM deployment issue, and he again indicated his inability to understand McNamara's great concern about ABM's destabilizing effect:

We believe the discussions should center not only merely on the problems of an antimissile system, because after all the anti-missile system is not a weapon of aggression, of attack, it is a weapon of protection--it's a defensive system.\(^{75}\)

The President's January promise to pursue arms limitation discussions had been carried out, but the U.S.S.R. was unwilling to engage in such negotiations. The administration was therefore forced to move to the second stage of that January policy, i.e., reconsideration of the NIKE-X deployment decision. Political clamoring for deployment, reinvigorated by the Chinese hydrogen bomb success, was again becoming difficult for President Johnson to ignore. McNamara, although disappointed by the Glassboro results, remained opposed in principle to ABM deployment, and he had continuing support within the scientific community.\(^{76}\) Both sides of the NIKE-X issue had made their cases to

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\(^{75}\)Quoted in Murrey Marder, "Russia Rejects Talks on Anti-Missile Race," Washington Post, June 27, 1967.

\(^{76}\)The Bulletin of the Atomic Scientists, monthly commentary magazine on science and world affairs, devoted substantial portions of its April, May, and June, 1967, issues to articles on the ABM. The majority of these writings were critical of ABM systems as contributors to national security, and many backed McNamara's basic position regarding the arms race. It is interesting to note, however,
the President, and he did not delay long after the Kosygin meeting to make his new decision.

that one particular article which was basically sympathetic to the Defense Secretary's concern with strategic arms races took him to task regarding his approach to the Soviet Union. Written prior to April 1, 1967, the critique would prove to be somewhat prophetic:

If Mr. McNamara and other officials of the Administration lead people to think that the only issue for negotiation is anti-ballistic missile deployment, then when the negotiations fail, as they are almost certainly likely to do if they do not include limitations on offensive strategic weapons, there will be the inevitable pressure in the United States to proceed with full production and deployment of our own NIKE-X anti-missle system.

CHAPTER XI

SENTINEL AND NATIONAL SECURITY: ABM FOR THE UNITED STATES

In the aftermath of Glassboro, President Lyndon Johnson was confronted with the legacy of the ABM policy which he had chosen six months earlier. He had provided deployment funds for an ABM, and had implied that failure to negotiate an ABM freeze with the U.S.S.R. would lead to release of those funds. The President wanted very much to accomplish something in the area of world peace which could in part counterbalance the image of warmaker which he had inherited as a result of the Vietnam war. Encouraged by his Secretary of Defense, Johnson had for many months hoped that negotiations with the Soviet Union on strategic arms limitations would provide just such an image. The Glassboro experience left the President with the feeling that the U.S.S.R. had to be prodded somehow into such negotiations. In addition to his desire to bring the Soviets to the conference table, President Johnson could not help but be aware of the growing Republican interest in resurrecting the defense "gap" issue, to be built upon Democratic refusal to deploy an ABM, in the 1968 election campaign. Within days after the Glassboro conference, the President informed Secretary McNamara that he had decided to proceed with deployment of a ballistic missile defense system.1

[1]This entire chapter is heavily indebted to those key government officials who provided this author with background information relevant to the President's deployment decision.
Foremost in President Johnson's mind was the hope that announcement of such a decision, or at least initial efforts to actually deploy such a system in the U.S., would result in Soviet acceptance of a format for substantive strategic arms limitation talks. While McNamara remained opposed in principle to the idea of deploying an ABM, he took the initiative on the matter. If the President wanted such a system, then the Secretary preferred to present that decision at a time and in a format of his choosing. Johnson apparently accepted this request and, as he had traditionally done in matters of strategic weapons policy, left to McNamara the specific formulation of a public rationale for the ABM deployment. There is little to indicate that the President himself harbored any particular preference as to the type of missile defense which might be built, other than his agreement with the majority of his advisors that a large anti-Soviet deployment made little sense.

The activities of Secretary McNamara in implementing the President's decision have been the subject of some controversy and confusion on the part of both outside observers of defense decision-making and actual participants in that policy process. The Secretary played a unique role in the months between early July and late September of 1967, and his actions illustrate his great concern over the possible ramifications of President Johnson's desire to deploy an ABM system. McNamara chose to construct what he considered to be the optimal strategic and political format for announcing the deployment, and he began immediately after receiving the President's directive to plan his approach.
TO IMPLEMENT THE DECISION: THE SEARCH FOR A PUBLIC RATIONALE

The first issue facing the Defense Secretary was the question of what kind of system to deploy. The deployment favored by DDR&E, the thin $3-5 billion area defense, was the most attractive candidate. That configuration was the least costly of the alternatives which OSD had seriously debated, and it offered some degree of defense in a number of contingencies. As early as December, 1966, Assistant Secretary Alain Enthoven's Office of Systems Analysis had generated an actual design (number and location of radars, interceptors, etc.) for such a system, and the Department of the Army produced a detailed plan for that deployment in February of 1967. On July 5, 1967, General Austin Betts' Army R&D staff presented to OSD a revised edition--later to be named SENTINEL--of their design, which included both a thin area defense using the SPARTAN interceptor and a modest hardpoint defense--using the SPRINT ABM--of the MINUTEMAN force.\(^2\)

McNamara's basic feelings concerning the disutility of forcing the Soviet Union to increase their strategic weapons inventory led the Secretary to favor as limited a version of the Army's ABM as possible. Accordingly, the thin area defense was acceptable to him in light of less desirable alternatives, e.g., the NIKE-X "Posture A" or "Posture B" which Army officials had contemplated. In addition to the issue of

\(^2\)Interview R. Costs for SENTINEL were set at $4-5 billion, approximately $600 million of which was for the hardpoint portion. The MINUTEMAN defense was viewed by OSD as an inexpensive (given the sunk cost of the area defense) hedge against the evolution of the greater-than-expected Soviet threat.
system size, the Secretary was greatly concerned about the manner in which the American ABM was justified to the nation and to the world. Whatever the nature of the system chosen, McNamara was determined to present it in conjunction with a rationale which minimized the likelihood that the U.S.S.R. would view the action as a threat to that nation's deterrent. The justification would have to communicate clearly to both the American public and the Soviet leadership the belief that (a) population defense against Russian (or U.S.) ICBMs was futile, and (b) the planned American ABM in no way implied a belief that such an anti-Soviet defense was feasible.  

There had arisen in the course of the ABM debate three rationales for U.S. missile defense which did not entail the Army-preferred anti-Soviet population defense. The first rationale, with roots reaching back to the post-SPUTNIK era and the Gaither Committee, contemplated using the ABM system to defend U.S. offensive forces. The "hardpoint" concept, frequently mentioned by administration officials in the FY68 budget testimony, was not a damage limitation device, but an assured destruction technique.  

A second rationale, little-discussed in public debate yet argued by a number of DOD personnel, saw a thin ABM as a useful low-cost insurance policy capable of providing some defense in a number of plausible contingencies. This argument credited the missile defense with offering some degree of protection for a whole 

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3As early as the last months of 1966, McNamara had begun to seek from certain of his advisors specific formulations of these arguments, formulations which might later be used as deployment presentations.

4For the distinction between these two strategic objectives, see supra, p. 265.
spectrum of scenarios, ranging from a single accidental ICBM launch through limited nuclear exchanges and even including large Soviet attacks. Within both Systems Analysis and DDR&E, this perception of a thin defense as a useful low-confidence measure had numerous supporters.5

The anti-Chinese argument provided the third ABM deployment rationale associated with limited U.S. missile defenses. Since the Communist Chinese detonated their first nuclear device in 1964, this position had often been voiced by non-Army ABM proponents. Even prior to that date, defense officials had heard arguments concerning the potential dangers inherent in the emergence of "Nth Country" nuclear threats. There were a number of specific arguments and scenarios used to support the idea of an anti-Chinese ABM, and each of these justifications had roots in traditional American concern over Asian security and Chinese xenophobia. In particular, alternative views of an irrational China ignoring the overwhelming U.S. strategic offensive forces or of a coldly calculating China using its small nuclear threat as a blackmail device led to support for a thin area defense in the United States.6

5Interview R, Interview T, Interview W. The inclusion of the heavy Soviet attack as an interesting case of a thin ABM system's utility may seem strange in light of OSD's continuing rejection of heavy ABM defense concepts. However, the above argument viewed even a thin missile defense (500-1000 interceptors) as useful against the Soviets, especially given uncertainties about the sophistication of enemy penards. The position credited the ABM with some effectiveness, not "good" or "high" effectiveness.

6Even PSAC's ABM panel, generally pessimistic of the Army's approach to ballistic missile defense, did credit a thin area defense--as a finite, non-building block deployment--as useful in both the accidental launch and anti-Chinese scenarios. Interview Y.
In order to construct what would be for him an acceptable public rationale for the President's deployment decision, McNamara initiated a process of study and debate among his advisors and colleagues in the administration. The Secretary's criterion was simple: It was of the utmost importance to convey to all potential listeners the argument that defense of the U.S. population against the Soviet ICBM threat was an impossible task. Whatever justification was provided for the contemplated limited deployment, it had to make this point clear, as McNamara wanted no argument left open through which proponents of an anti-Soviet defense could rationalize an extension of the initial "thin" system. It was paramount that the administration differentiate between a limited defense which was deemed effective for limited purposes and a more extensive system which was viewed as a futile action in light of Soviet capabilities.

By mid-June, Secretary McNamara had already received a detailed policy recommendation which could potentially stand as a justification for the upcoming ABM deployment. In preparation for the FY69 DPM on strategic offensive and defensive forces, OSD's Office of Systems Analysis had again examined the U.S. assured destruction capability in light of the "greater-than-expected" Soviet threat. By postulating a larger and more accurate, MIRV-equipped Soviet ICBM force, along with an extensive ABM and anti-bomber defense in the U.S.S.R., Systems Analysis created a situation in which the U.S. MINUTEMAN force would indeed be vulnerable to a Soviet counterforce first strike.\footnote{It had been understood for some time that the MINUTEMAN force could become vulnerable in this way. See supra., p. 287.}
number of alternative methods for reestablishing an assured destruction capability equivalent to the pre-GTE level, the analysis recommended that a hardpoint SPRINT defense of MINUTEMAN deployed, with production to be initiated in FY1968.\textsuperscript{8}

The Systems Analysis recommendation also noted the value of the new SPARTAN interceptor and its capability to provide a useful total area defense against the evolving Chinese threat. However, the analysis placed first priority on the hardpoint MINUTEMAN defense, arguing that a limited ABM paid for itself in this assured destruction role. The anti-China portion was pictured more as a side benefit of the hardpoint deployment than as an interesting independent type of system.\textsuperscript{9} Secretary McNamara had in the past utilized the weapons systems comparisons of the Office of Systems Analysis as major inputs into his decisions on defense programs. In this particular case, however, the Secretary had two objections to using the hardpoint MINUTEMAN defense analysis as a public rationale for American ABM deployment.

\textsuperscript{8}Interview P, Interview V. Two alternative methods of regaining higher assured destruction levels, superhardening of MINUTEMAN silos and procurement of a new ICM (Improved Capability Missile) to augment MINUTEMAN, were rejected as being more costly. It is important to note that such an analytic outcome is dependent upon both the size of the enemy force assumed and upon the degree of uncertainty which OSD was willing to accept regarding the performance of the various systems. Additionally, the calculations were sensitive to the percentage of SENTINEL costs which were charged to the hardpoint defense. It was possible to "write off" a large percentage of the deployment by charging it to be the "anti-China" aspect of the system, thus making the ABM option look much more favorable as an assured destruction device.

\textsuperscript{9}Interview W. Interview P. For a detailed description of the Systems Analysis examination of the ABM issue in the first half of 1967, see the text of a speech by Robert C. K. Valtz, Deputy Assistant Secretary of Defense (Systems Analysis), delivered to the Harvard Business School Club, Salt Lake City, Utah, January 16, 1968.
Central to McNamara's rejection of the hardpoint deployment recommendation was his assessment that the Systems Analysis study failed to treat properly major aspects of the philosophy underlying both the assured destruction calculus and the greater-than-expected threat planning technique. Programs for assured destruction traditionally implied high-confidence performance. Given the perceived importance of the deterrent force, weapons fulfilling the assured destruction role were required to perform their function at low levels of uncertainty. In the Secretary's view, there were far too many unknowns associated with ABM systems performance in large-scale nuclear attack scenarios, especially when the defense faced a highly sophisticated enemy. For McNamara, the idea of superhardening the silos of the reliable MINUTEMAN or increasing the size of the sea-based POSEIDON missile force represented alternative assured destruction techniques which were more in line with the performance confidence levels associated with an effective deterrent force.

The Defense Secretary further questioned the hardpoint deployment recommendation on the ground that it misused the GTE planning concept. The GTE threat projections represented major upward revisions of current intelligence predictions of the future Soviet threat. As such, they indicated what the U.S.S.R.'s force might look like if the enemy made a full-scale effort to utilize all available technology and in fact deployed strategic systems at rates approaching maximum production capability. These predictions had been designed to illustrate potentially valuable areas for U.S. R&D commitments, areas where modest
resource allocations could maintain a capability to respond with new American forces should the Soviet strategic forces actually attain GTE levels at some time in the future. In the case of the Systems Analysis ABM recommendation in June of 1967, however, the study called for actual deployment, not just R&D.

As far as McNamara was concerned, such a recommendation was valid only if two conditions held true. First, the predicted threat had to be one which was in fact expected to evolve in the early 1970's, not one conjured up as a planning aid. Second, even if such a threat did appear imminent, it was necessary to demonstrate that only by initiating deployment in FY68 could the U.S. have its hardpoint defense in place in time to meet that threat. McNamara did not accept either of these stipulations. While the GTE threat could theoretically evolve as the study indicated, there were no current signs to suggest that the U.S.S.R. planned such a buildup within the 1972-73 time frame. In addition, the status of the U.S. ABM components making up the hardpoint system--the MSR radar and the SPRINT interceptor--were sufficiently developed so as to allow any deployment decision to be delayed at least until calendar year 1968.

10Interview W, Interview BB. See supra., p. 289.

11Ibid., also Interview CC. The kind of Soviet buildup associated with GTE was indeed massive. This author's rough estimate of the five year costs associated with the kinds of ICBM, MIRV, ABM, and aircraft defense implied by the GTE puts the Soviet resource requirement in the $50-75 billion (U.S. dollars) range.
In addition to these criticisms of Systems Analysis' interpretation of assured destruction and the GTE, McNamara objected to the hardpoint ABM argument on the ground that the rationale did not satisfy his criterion for an acceptable public deployment rationale. The Secretary sought to underscore his belief that ABM defense against the Soviet threat was futile, and he felt that the hardpoint rationale required the administration to draw too thin a line between an anti-Soviet MINUTEMAN defense and an anti-Soviet population defense. While the distinction was well understood within the defense community, McNamara felt that to argue deployment in anti-Soviet terms, however far removed from the city defense issue, was to leave the administration open for pressures to expand a limited hardpoint ABM into a large population defense.

Although he did approve of the idea of a limited hardpoint deployment as an interesting hedge technique once the costs of a thin area defense were sunk, the Secretary rejected that argument as a rationale for announcing a thin U.S. ABM deployment. For similar reasons, McNamara eschewed the second potential rationale cited above, the one which credited a limited area defense system with providing a useful defense capability across a whole range of scenarios. Again, his objection stemmed from the difficulty he

\footnote{As conceived by both the Army and OSD, the contemplated thin ABM included a total area defense costing some $3.5-4 billion, plus a modest hardpoint MINUTEMAN defense costing $600 million-$1 billion. Although the hardpoint portion was not extensive enough to offer major protection of MINUTEMAN in the face of large Soviet counterforce strikes, it did represent an interesting hedge against the currently projected Soviet ICBM force. \textit{Interview R.}}
foresaw in attempting to explain in the same breath that a small deployment was a good idea against certain Soviet actions while a larger one was not.\textsuperscript{13} Having rejected both the hardpoint and the "useful in many scenarios" arguments, the Secretary was left with the anti-China rationale as the one case which went furthest in separating a limited ABM from the issue of an anti-Soviet defense.

THE CHINA ARGUMENT: A RATIONALE IN SEARCH OF FORM

If he could present the President's ABM deployment as a defense against the Chinese ICBM threat, McNamara could use the distinction between the threats posed by the two Communist missile forces to argue his point about the futility of an anti-Soviet ABM. By distinguishing between anti-Chinese and anti-Soviet ABMs, he could better argue the perceived effectiveness of the former while continuing to reject the value of the latter. The Secretary had since late 1964 demonstrated considerable interest in the idea of an ABM designed to counter China, and had made frequent mention of the concept in past posture statements.

While his early attention to the issue seems to have been based upon a genuine interest in the idea of building a defense against the future Chinese threat, McNamara's position appeared to

\textsuperscript{13} Interview W, Interview BB, Interview R. Within the "useful in many scenarios" argument, McNamara objected most strenuously to the observation that, even for the most massive Soviet attacks, a thin system could provide some level of protection, depending upon the number of RVs which the U.S.S.R. allocated per target. McNamara's successor, Clark Clifford, was to use this very argument before the Congress. See the text of his news conference at the Pentagon, Washington, D.C., June 20, 1968.
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shift in 1966 and 1967. Fearful that any ABM deployment, no matter how small, would balloon into a heavy defense, he gradually de-emphasized the idea of initiating an anti-China system. He continued to present the concept, however—in part, it seems—because he accepted the idea that the China argument would be the most acceptable way in which to rationalize any deployment which the administration might choose to initiate for other reasons. By July of 1967, the Secretary had decided that the President's decision would best be presented in just these terms.

In formulating the anti-China rationale, McNamara sought the advice of a number of his advisors and colleagues in the administration. In particular, he initiated continuous discussion processes with three officials, Assistant Secretary of Defense Alain Enthoven, Deputy Assistant Secretary of Defense for Arms Control Morton Halperin, and President Johnson's Special Assistant for Science and Technology, Donald Hornig. These discussions examined a number of specific forms of the China argument, and served to solidify McNamara's own preference for the kind of rationale which he found to be most plausible. In the Secretary's mind, it was not enough to argue that an ABM was needed because China would possess an ICBM capability in the 1970's—it was necessary to explain why a $4-5 billion American defensive system was necessary against that nation even in light of the overwhelming U.S. strategic weapons advantage.

In order to make a case for an anti-Chinese missile defense, McNamara had to make one of two alternative kinds of argument. On the one hand, he could deemphasize the issue of deterrence and argue
that an anti-China ABM was both feasible and relatively inexpensive, and should therefore be bought. This was essentially the view which the Secretary had presented in his 1965 Posture Statement, but he disliked the possible public interpretation which might greet such an argument in 1967. If one were concerned—as McNamara was—that ABM deployment meant a new chapter in the arms race, then it was not prudent to justify such a momentous action purely on the grounds that it did not cost too much. Such an argument left the administration open to two lines of attack.

First, NIKE-X supporters could argue that money should not be a major constraint in matters of national survival, and that if the system was effective enough to warrant a $3-4 billion commitment, then the U.S. could afford a much larger system to counter the U.S.S.R. Second, critics who sought larger ABM systems could question the President's priorities: Why make such a major expenditure aimed at countering a "second-rate" nuclear power without committing significantly greater resources versus the more powerful U.S.S.R.? While both criticisms were answerable in terms of McNamara's distinction between an effective and limited ABM and an ineffective and massive missile defense, the line of argument which merely noted the system's effectiveness and comparatively low costs clouded the Secretary's distinction between the two threats. It did not provide the kind of wedge which McNamara sought to drive between the limited ABM and any possible extension of such a system.
The alternative to deemphasizing the deterrence issue in justifying an anti-Chinese ABM was to argue that there were conditions in which the admittedly overwhelming U.S. offensive force advantage would not deter Chinese nuclear attack. Having presented such contingencies, one could then cite a limited ABM as a useful technique to defend the otherwise vulnerable United States. There were a number of possible circumstances which could be used as examples of situations where Communist China might attack the U.S. in spite of the latter nation's overwhelming strategic superiority. Such examples can be categorized in three general groups, each of which was scrutinized in detail by Secretary McNamara and his colleagues during the summer months of 1967.

The "failure of deterrence" case which perhaps received the most public attention was one which viewed China as a wildly irrational nation which might totally ignore the overwhelming U.S. strategic force and attempt to destroy the "Paper Tiger" by launching its small ICBM force. The excesses of the "Cultural Revolution" and the rampages of the Red Guard strengthened this perception of a demented China. Such predictions of Chinese behavior led to the argument that a U.S. ABM was the only way to prevent American damage, given the absence of any traditional deterrence mechanism. While the "irrationality" argument had its supporters in the Congress and the services, McNamara and his advisors did not feel that the scenario was particularly interesting. Chinese internal turmoil had been both bothersome and bewildering to many Americans, but the international activities of China, while marked
by hostile rhetoric, had historically been quite cautious.\footnote{The general attitude on this argument held by DOD civilians is reflected in two speeches given subsequent to Secretary McNamara's September, 1967, announcement of the U.S. deployment decision. See the text of an address by Assistant Secretary of Defense for International Security Affairs Paul C. Warnke, delivered to the Advocates Club, Detroit, Michigan, October 6, 1967, pp. 8, 12; and the speech by Deputy DDR&E Director Finn Larsen, given at Millsaps College, Jackson, Mississippi, January 10, 1968, p. 14.}

The second variant of the "failure of deterrence" problem was in many ways the antithesis of the first. There were a number of people in DOD who reversed the "irrational" idea and credited the Chinese as being coldly rational men who understood very well the great disparity between the U.S. strategic force and the small Chinese force. Certain advisors argued to McNamara that the vulnerability of China's nuclear capability implied scenarios in which a U.S. ABM would prove indispensable:

In a crisis which they had brought on, if the Chinese came to believe that the United States might attack, they might be tempted to launch a pre-emptive strike, hoping to bring down at least a part of the American house in the face of total destruction, or even only the destruction of their nuclear forces, which at the moment of crisis they feared we were about to wreak upon them.... This danger will pass when China develops, as the Soviets have done, a secure second strike capability. In the interim, we decided that as long as it was within our technical capability to provide an effective defense against this danger, prudence seemed to dictate that we deploy that defense which would further deter the Chinese from pre-empting, and eliminate or greatly reduce our casualties should they engage in such an act.\footnote{Warnke speech, p. 12.}

Although such a scenario was somewhat more plausible to McNamara than was the "irrational" concept, the Secretary did not feel that
the argument was strong enough to stand as an acceptable public justification for a U.S. ABM. The U.S.S.R. had refrained from such preemptive attack at times when the nation's ICBM force could have been characterized as "small and vulnerable," and similar restraint could be forthcoming from the Chinese.

The remaining category of scenarios involving the Chinese ICBM threat were those associated with the concept of blackmail. McNamara did not find particularly interesting those U.S.-China scenarios which resulted in actual Chinese nuclear attacks following U.S. threats. While such scenarios were indeed conceivable, they did not loom so important for the Secretary as to justify a $3-5 billion "insurance policy" in the form of an ABM. If he was to justify such a defense of the United States on the basis of the Chinese threat, there was only one type of scenario which the Secretary of Defense found to be interesting enough and plausible enough to warrant its use as a deployment rationale. It was this scenario, a kind of "blackmail" situation, which McNamara chose to use, and it was this case which he discussed and debated in detail with men like Enthoven, Halperin, and Hornig.16

The presence of a Chinese nuclear missile force would facilitate the issuance of threats, implicit or explicit, such that the United States or some other nation should refrain from acting in

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16 The following analysis of the Defense Secretary's process of formulating the "China argument" to be used as an ABM deployment rationale is based upon this author's interviews with numerous administration officials involved in that process.
a particular manner or else face possible nuclear reprisal. While McNamara was less concerned with the possibility of direct and explicit threats of this kind, he did recognize the potential international ramifications of such an implicit threat. The Secretary was primarily interested in the impact of China's attainment of a nuclear delivery capability upon future conventional war scenarios in Asia. McNamara felt that historically, the U.S. strategic nuclear force had acted as an important deterrent to Chinese land wars on the Asian continent. Because the United States could effectively threaten nuclear attack against the Chinese without fear of any reprisal against American cities, the deterrent was a credible one.

The Secretary interpreted the reasons behind the Chinese development of an ICBM force as being twofold. First, there were obvious world prestige gains associated with the attainment of a nuclear force. Second, and more important to McNamara, a small Chinese ICBM force constituted a logical low level, low confidence technique capable of counteracting the U.S. nuclear threats mentioned above. The action was a counter to U.S. blackmail, and could free China to pursue more hostile conventional military activities in Asia. For McNamara, the Chinese ICBM force did imply a useful kind of "minimum deterrent" to American nuclear threats.

Given this assessment of Chinese motives and understanding the desire of the United States to prevent Chinese aggression in Asia while avoiding massive land wars against that nation, McNamara could

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17 The formulation of this scenario as it was initially communicated to McNamara is generally credited to University of Chicago professor Albert Wohlstetter.
see a justification for constructing an anti-Chinese ABM. Such a U.S. action represented the only way in which American could "buy back" the original situation where the threat of U.S. nuclear attack constituted a credible deterrent to Chinese aggression at the non-nuclear level. This was valuable to the U.S. both with regard to direct relations with the Chinese and with regard to American guarantees to its Asian allies. Just as in the case of the United States' European allies and the Soviet threat, the presence of a Chinese threat to the continental U.S. could lead to doubts on the part of Asian allies as to American willingness to fight a nuclear war over any issue short of a direct threat to the United States. For McNamara, a thin ABM could act to remove or at least reduce such doubts.

SPEECH-WRITING AND DEBATE: THE DEPLOYMENT ARGUMENT TAKES SHAPE

The President wanted his deployment decision announced sometime in the fall of 1967, and Secretary McNamara wanted to insure that the decision was conveyed to the nation and to the world in such a manner that made clear administration attitudes concerning ABM capabilities and nuclear war. Even prior to the President's deployment decision,

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18 Interview Y. Involved in the Secretary's argument was an assumption that had been the subject of major debate among defense policy experts in past years, i.e., the question of whether or not nuclear forces and the threat of their employment constituted a credible deterrent to non-nuclear aggression on the part of an opponent. While McNamara had in the past argued that a proper deterrent to a broad spectrum of warfare required an equally wide range of options for response, his reluctance to engage in large-scale conventional war against China made the nuclear threat idea look more attractive as a technique for deterring Chinese aggression.
McNamara had sought from his advisors ideas and formulations of arguments expressing both the dangers of the action-reaction phenomenon in strategic weapons competition and possible justifications for limited ABM deployments. In early July, a preliminary draft of an ABM deployment speech was prepared, and debate began in OSD over the specific form of the arguments made to support the President's decision. Although limited to a small group of the Secretary's advisors, this debate—which continued through the month of August—covered a wide range of issues concerning nuclear strategy and ballistic missile defense.

McNamara sought two things from his advisors—detailed examinations of various arguments supporting a deployment decision, and up-to-date studies of the predicted status of potential enemy forces and U.S. ABM potential in light of such predictions. OSD's Office of Systems Analysis submitted a revised version of its DPM discussion of the utility of thin ABM deployments, and included a modified analysis of the issue of lead times relevant to both the anti-Chinese and hardpoint aspects of the contemplated U.S. missile defense. Although he had approved the inclusion of the Systems Analysis recommendations for deployment in the 1968 Strategic Forces DPM, McNamara questioned the basis for the argument that a hardpoint MINUTEMAN defense had to be initiated in FY1968.

Systems Analysis responded by modifying its original position to fit the Defense Secretary's intention to deemphasize the issue of Soviet nuclear capabilities in justifying the planned U.S. ABM. The second study noted that the specific ABM components making up the hardpoint
portion of the system—SPRINT and the MSR—were further developed than were the key elements of the area defense portion, the SPARTAN and the PAR. Therefore, even if one were to argue that Soviet offensive capabilities would seriously threaten the MINUTEMAN force by 1972-73, a decision to deploy the hardpoint portion could safely be delayed for perhaps a year after any decision to construct the anti-Chinese area defense. There was at least a twelve month lead time difference between the two sets of components, so the administration could logically leave aside the hardpoint issue in announcing a decision to construct the anti-China system.19

In a second major shift from previous analyses, the Systems Analysis paper argued that the time had indeed run out with regard to the Chinese threat, and that U.S. missile defense deployment had to be initiated in FY68 in order to be in place in time to counter China's ICBM force. Earlier studies in OSD had set the date for existence of an operational Chinese ICBM threat in the 1974-76 time period. Assuming a six to seven year lead time for the U.S. area ABM, this assessment would mean that the American deployment initiation could be delayed until FY69. However, these earlier estimates had dealt with predictions of an operational production line ICBM capability for the Chinese. Taking a cue from the legislators on the Joint Committee on Atomic Energy, OSD defined the Chinese threat as becoming significant at a lower technical level. Even a force of eight to ten prototype missiles could deliver nuclear warheads on the U.S., and this kind of

19Interview W.
capability appeared achievable by the Chinese as early as 1972.\textsuperscript{20}

As drafts of the Secretary's speech circulated among a limited group of advisors within the Pentagon, debate continued. Arguments of three types dominated the discussion. There was controversy as to what form the China argument should take and the degree to which the speech should attempt to elaborate upon the kinds of scenarios involved in the rationale. There were also a number of advisors who disliked the Chinese rationale in general, and sought an alternative justification for the U.S. deployment. This group of critics favored the more general rationale cited earlier in this chapter, the one which viewed a thin area ABM as useful in a limited fashion in a number of scenarios ranging from an accidental ICBM launch to a Soviet attack. Finally, there was considerable debate as to the specific form which McNamara's speech should take. What was the optimum manner in which to argue both the perceived futility of an anti-Soviet ABM and the rationale for a limited defense against the Chinese?

What finally emerged from this process in early September was a speech which was and would remain highly controversial both because of the decision it carried and because of the manner in which Secretary McNamara discussed the ABM issue. The Joint Chiefs of Staff had approved the limited deployment, but included the caveat that such a system was useful only as a first step toward a much larger anti-Soviet defense. Some DOD officials who shared McNamara's dislike of any deployment were particularly upset by the anti-China rationale, which was viewed by these men as a very weak position. While the Department of the Army

\textsuperscript{20}Interview V. See supra., p. 347 for references to the original OSD-JCAE debate on the timing of the Chinese threat.
was not doubt pleased that a U.S. commitment to actual deployment had finally been secured, officials in that service were not strong supporters of the anti-China position, and preferred to present the issue in anti-Soviet terms.

Secretary McNamara chose to make his deployment announcement at an already-scheduled speaking engagement in September in San Francisco before the editors and publishers of United Press International. As this date grew nearer, it was apparent that the Secretary had succeeded in keeping the President's decision a closely guarded secret. Even among some high level advisors in the Defense Department, there was a belief that no real decision had been taken, and that McNamara's search for arguments and rationales pertaining to a possible deployment had been conducted to allow President Johnson to make such a decision later in the year. The Secretary had insisted that his argument concerning the futility of an anti-Soviet missile defense stand independently of any deployment decision, and this seemed to add to the feeling in some quarters that the issue remained open. The apparent absence of Congressional knowledge of the administration's decision to deploy was reflected in the extent to which pro-ABM groups in the legislative branch continued to argue publicly for NIKE-X production.

Both the Joint Committee on Atomic Energy and the Senate Appropriations Committee issued statements calling for ABM deployment, and both the developing Chinese threat and the failure of the arms negotiations efforts with the Soviet Union were cited in support of these

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21 For one public indication of the nature of this belief, see "Sentinel Decision Startled DOD Planners," Aviation Week and Space Technology, August 12, 1968, pp. 77-81.
requests. The issue was again debated in the full Senate as the DOD Appropriations bill was voted, and the Republican Party's House Policy Committee renewed the "gap" issue in calling for immediate approval of NIKE-X. In early September, senior JCAE member Senator John Pastore repeated the call for immediate deployment, and 1968 Republican presidential hopeful Richard Nixon urged an ABM go-ahead "at all costs" because the Soviets might otherwise gain a strategic superiority or parity, neither of which would be desirable for the U.S.  

The President gave final approval to McNamara's speech draft during the first week in September, probably at the weekly Tuesday luncheon with the Defense Secretary. The date of the San Francisco address was to be Monday, September 18. On Friday, September 15, administration officials informed key Congressional leaders of the decision to deploy a thin system. At the same time, Secretary of State Dean Rusk apparently conveyed a similar message to Soviet Ambassador Anatoly Dobrynin, who has just returned to Washington from Moscow. The communication to the Soviets again stressed the U.S. desire to begin serious strategic arms limitation talks, even in light of the decision to deploy.


25 George C. Wilson, "'Thin' Missile Defense Chosen to Guard U.S.,"
THE SAN FRANCISCO SPEECH: THE INTENTIONAL PARADOX

The speech which Robert McNamara delivered on September 18, 1967, was an impassioned warning concerning the dangers inherent in nuclear weaponry and arms competition. Inserted in the midst of a series of arguments in opposition to major expenditures for missile defense, the President's decision to deploy a thin ABM seemed out of place, if not illogical, given the general tone of the address. The Secretary did not elaborate, beyond a few sentences, as to why the administration had chosen to construct an ABM as a counter to the Chinese threat, and this absence of a strong rationale for the decision--an absence uncharacteristic of the Secretary in his public explanations of policy choices--reinforced the paradox which McNamara had sought to communicate. The general public reaction to the speech, as reflected in the American press, indicated that the Secretary had indeed succeeded in emphasizing his view of the dangers of unfettered U.S.-Soviet competition in strategic weaponry and the special problems which ABM systems brought to that competition. Because the San Francisco speech reflects many of


26 The content of the speech led a number of government officials not actually involved in the drafting of the address to comment to this author that it seemed the arguments had been written to reinforce an announcement of the administration's intention to oppose any ABM deployment, and that the President's decision to deploy had been hastily added at the last moment. Although this was definitely not the case (Interview P, Interview W), McNamara had succeeded in making his point about the futility of any effort to construct large anti-Soviet ABM.

27 The following editorials are generally indicative of the kinds of public reaction which the speech engendered. See: "Mr. McNamara Faces Both Ways," St. Louis Post-Dispatch, September 20, 1967; "Antimissile Missiles," Christian Science Monitor, September 22, 1967; "Missile
the issues central to the ABM debate, and because it is a true watershed in the long history of the ballistic missile defense issue, it is useful to review portions of the address here.

The majority of the speech dealt with the strategic relationship between the United States and the Soviet Union, and was directed both to Soviet leaders and to those in the United States who favored major new arms expenditures designed to outdistance Russian strategic forces. McNamara emphasized that neither great power could hope to achieve a "first strike capability," i.e., the ability to eliminate substantially all of an enemy's retaliatory offensive forces through a surprise attack. Because both sides maintain the technological and economic capability to compete in any arms buildup, either nation's decision to construct sufficient forces to achieve a first strike capability would only lead to a futile arms race.


McNamara's critics in the Congress had in the past argued for U.S. ABM deployment on grounds that such a program was necessary for continued U.S. "superiority" over the U.S.S.R. The Secretary noted that the U.S. did in fact have such superiority, using as a criterion the number of deliverable nuclear warheads, and that this advantage was so large as to be "more than we require." 29 He then described the manner in which conservative U.S. strategic force planning, necessitated by major uncertainties about Soviet intentions, had created the then current American nuclear superiority. It was this inability to understand Soviet motives, and that country's inability to comprehend American intentions, which in McNamara's view lay at the heart of the arms race problem:

If we had had more accurate information about planned Soviet strategic forces, we simply would not have needed to build as large a nuclear arsenal as we have today. Now let me be absolutely clear. I am not saying that our decision in 1961 was unjustified. I am simply saying that it was necessitated by a lack of accurate information.

Furthermore, that decision in itself—as justified as it was—in the end, could not have possibly have left unaffected the Soviet Union's future nuclear plans. What is essential to understand here is that the Soviet Union and the United States mutually influence one another's strategic plans.

Whatever be their intentions, whatever be our intentions, actions—or even realistically potential actions—on either side relating to the build-up on nuclear forces, be they either offensive or defensive weapons, necessarily trigger reactions

29 Ibid., p. 108.
on the other side. It is precisely this action-reaction phenomenon that fuels an arms race.

The Secretary then turned to the issue which was of central importance to him and President Johnson, the question of U.S.-Soviet negotiations to limit strategic arms competition:

but since we now each possess a deterrent in excess of our individual needs, both of our nations would benefit from a properly safeguarded agreement first to limit, and later to reduce, both our offensive and defensive strategic nuclear forces. We may, or we may not, be able to achieve such an agreement. We hope we can. And we believe such an agreement is fully feasible, since it is clearly in both our nations' interests.

Having stated his views on strategic arms races and the need for U.S.-Soviet cooperation, McNamara turned to the specific issue of ABM systems. He first argued that the Soviet Union's limited ABM "does not impose any threat to our ability to penetrate and inflict massive and unacceptable damage on the Soviet Union." Should the United States deploy a ballistic missile defense against the Soviet ICBM threat? The Secretary's answer was an emphatic "no."

Money was not the problem, McNamara argued. If the U.S. could obtain an effective missile defense for 40 billion dollars, then the nation could afford the cost. The problem lay in the enemy's ability simply to build more ICBMs, thus creating a situation where the offense could again overwhelm the defense:

30 Ibid.
31 Ibid., p. 109.
32 Ibid.
Were we to deploy a heavy ABM system throughout the United States, the Soviets would clearly be strongly motivated to so increase their offensive capability as to cancel out our defensive advantage. It is futile for each of us to spend 4 billion dollars, 40 billion, or 400 billion—and at the end of all the spending, and at the end of all the deployment, and at the end of all the effort, to be relatively at the same point of balance on the security scale that we are now.

In point of fact, we have already initiated offensive weapons programs costing several billions in order to offset the small present Soviet ABM deployments. That is money well spent; and it is necessary. But we should bear in mind that it is money spent because of the action-reaction phenomenon. If we in turn opt for heavy ABM deployment—at whatever price—we can be certain that the Soviets will react to offset the advantage we would hope to gain.

The experience at Glassboro had convinced McNamara of the Soviet Union’s concern over U.S. offensive increases, especially the POSEIDON and MINUTEMAN III programs. He therefore issued a warning to the U.S.S.R. and to U.S. proponents of heavy ABM deployment. Should arms talks fail, the U.S. would respond to any increase in Soviet ABM capability by expanding its offensive forces, and not by making any major commitment to NIKE-X.34

The Secretary had made his point that an anti-Soviet ABM did not represent an interesting U.S. policy option, and he then turned to a discussion of other objectives for ballistic missile defense.

33 Ibid., p. 110. McNamara made reference at this point in the speech to the unanimous opposition to such a heavy ABM which had been provided to the President by all of the former Science Advisors and DDR&E directors in January of 1967. Supra., p.347.

34 Ibid.
Thus McNamara began his presentation of the anti-China rationale for a thin ABM. For the Secretary, China’s basic motivation for developing a nuclear force was “an attempt to provide a basis for threatening her neighbors, and to clothe herself in the dubious prestige that the world pays to nuclear weaponry.” He stressed his belief that the Chinese harbored no illusions as to the power of the U.S. offensive deterrent, and noted the caution with which that Asian power had avoided conflicts which could end in nuclear war with the United States.

Given this Chinese caution, might there be a possibility of a U.S.-China nuclear clash in the 1970's? McNamara argued that Chinese precipitation of such a conflict would be "insane and suicidal," but:

One can conceive conditions under which China might miscalculate. We wish to reduce such possibilities to a minimum. And...our strategic planning must always be conservative, and take into consideration even the possible irrational behavior of potential adversaries, there are marginal grounds for concluding that a light deployment of U.S. ABM's against this possibility is prudent.\(^{36}\)

The Secretary fixed the cost of such a limited ABM system at about $5 billion, and cited four other benefits which he associated with this type of missile defense, in addition to protecting the U.S. against direct Chinese attack:

- It would provide an additional indication to Asians that we intend to deter China from nuclear

\(^{35}\)Ibid.

\(^{36}\)Ibid., p. 111.
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\textsuperscript{35}Ibid.

\textsuperscript{36}Ibid., p. 111.
blackmail, and thus would contribute toward our goal of discouraging nuclear-weapon proliferation among the present nonnuclear countries. Further, the Chinese-oriented ABM deployment would enable us to add-as a concurrent benefit—a further defense of our MINUTEMAN sites against Soviet attack, which means that at modest cost we would in fact be adding even greater effectiveness to our offensive-missile force and avoiding a much more costly expansion of that force.

Finally, such a reasonably reliable ABM system would add protection of our population against the improbable but possible accidental launch of an intercontinental missile by any one of the nuclear powers.

The Secretary had mentioned briefly the three major rationales for limited ABM deployment which had arisen in the course of the ABM debate in past years—defense against small nuclear powers (particularly China), hardpoint MINUTEMAN defense, and protection against accidental launch. To these three he added his own preferred rationale—deterrence of Chinese nuclear-based blackmail in Asia. At this point, McNamara announced the decision which the President had made in late June, 1967:

After a detailed review of all these considerations, we have decided to go forward with this Chinese-oriented ABM deployment, and we will begin actual production of such a system at the end of this year.

As he concluded his speech, the Secretary reiterated his concern that the U.S. should avoid major expenditures on ABM systems, and made explicit the kinds of pressures which he perceived to

37Ibid.

38Ibid. (emphasis mine)
operate in pressing for such a heavy missile defense:

There is a kind of mad momentum intrinsic to the development of all new nuclear weaponry. If a weapon system works—and works well—there is strong pressure from many directions to procure and deploy the weapon out of all proportion to the prudent level required. The danger in deploying this relatively light and reliable Chinese-oriented A2M system is going to be that pressures will develop to expand it into a heavy Soviet-oriented ABM system.

We must resist that temptation firmly—not because we can for a moment afford to relax our vigilance against a possible Soviet first strike—but precisely because our greatest deterrent against such a strike is not a massive, costly, but highly penetrable ABM shield, but rather a fully credible offensive assured-destruction capability.

The so-called heavy A2M shield—at the present state of technology—would in effect be no adequate shield at all against a Soviet attack, but rather a strong inducement for the Soviets to vastly increase their own offensive forces. That, as I have pointed out, would make it necessary for us to respond in turn—and so the arms race would rush hopelessly on to no sensible purpose on either side.

Let me emphasize—and I cannot do so too strongly—that our decision to go ahead with a limited ABM deployment in no way indicates that we feel an agreement with the Soviet Union on the limitation of strategic nuclear offensive and defensive forces is any less urgent or desirable.39

The final lines of the speech provided an eloquent summary of Secretary McNamara's feelings about the need for increased attention throughout the world to the horrors of nuclear war and increased efforts to lessen or prevent the chance of such a catastrophe occurring:

It is said that nothing can prevent a man from

39Ibid.
suicide, if he is sufficiently determined to commit it. The question is what is our determination in an era when unlimited war will mean the death of hundreds of millions—and the possible genetic impairment of a million generations to follow? Man is clearly a compound of folly and wisdom—and history is clearly a consequence of the admixture of those two contradictory traits.

History has placed our particular lives in an era when the consequences of human folly are waxing more and more catastrophic in the matters of war and peace. In the end, the root of man's security does not lie in his weaponry. In the end, the root of man's security lies in his mind.

What the world requires in its 22nd year of the Atomic Age is not a new race toward armament.

What the world requires in its 22nd year of the Atomic Age is a new race toward reasonableness.

We had better all run that race. Not merely we the administrators. But we the people.

THE NATURE OF DEFENSE DECISIONMAKING: ALLUSIONS AND PARTIAL ANSWERS

This study began by setting forth two general objectives. First, the analysis sought to describe the defense decisionmaking process attendant to the ABM issue, with the goal of explaining why, after ten years of administration opposition to ABM deployment, the United States had decided in 1967 to produce such a system. Second, the case study was put forth as a potentially useful technique for examining a number of general issues and questions pertaining to the nature of the defense decisionmaking process. By documenting the ABM debate—the nature, sources, and political impact of

40 Ibid.
various arguments put forth in support of or in opposition to ABM deployment, this author sought to fulfil these objectives.

Chapters Two through Ten provide analyses in support of these two goals. These chapters indicate the manner in which U.S. administrations chose in each year between 1957 and 1966 to defer a deployment decision on ABM defenses. They describe too the relationships between these decisions and the general issues listed in Chapter One. Thus, the impact of such factors as technological capabilities, strategic perceptions, and political relationships within the federal system are documented and related to particular administrative actions bearing upon the ABM issue. In essence, these chapters offer answers to the question, "Why was ABM deployment rejected?" Chapter Eleven describes the manner in which President Lyndon Johnson decided to deploy a ballistic missile defense in the United States. The President's reasoning on the matter and the role of past events upon his choice are presented, as is an examination of the manner in which Robert McNamara implemented that decision. Here, then, an answer to the "why deployment?" question is presented, and Chapter Eleven documents that answer through an analysis of the chief executive's motives for acting as he did.

Chapter One also indicated the potential use of this study as a means of illustrating partial answers to questions about defense policymaking which could be of interest both to political scientists and to actual government policymakers. In particular,
five such questions were cited which seem relevant to the kinds of general issues central to American defense policy. This study has not sought to provide detailed answers to those questions—indeed, neither the range of cases nor the depth of specific research necessary to elaborate upon these individual issues is provided here. However, as noted in introduction, this author feels that these are the kinds of questions which are of particular importance in understanding the nature of defense decisionmaking in the United States. For this reason, it is useful to indicate the kinds of answers to these questions which are implied by this particular case study. Again, these are by no means complete answers, nor are they necessarily valid across a wide range of cases. However, they may be of some use to both policy analysts and decisionmakers.

1. **What is the role of public opinion in the formulation of strategic weapons policy, and can an American political party repeat the "missile gap" type of campaign issue with success equivalent to the 1960 experience?** Public awareness or understanding of the criteria for strategic force structure decisions remains extremely low, even given Defense Secretary Robert McNamara's efforts to communicate—through his annual posture statements—such information to as wide an audience as possible. The repeatability of the "gap" issue is doubtful under current political circumstances, both because of the lack of awareness noted above and, probably more
important, because strategic weapons policy has been displaced as a central national issue in the United States by other questions, particularly on the domestic scene. Indeed, it may be postulated that the 1960 election experience is a sort of cold war relic, and that recent criticisms of military budget levels may yield strong public opposition for future ABM funding on the scale contemplated by the United States Army.

II. What is the impact of interservice rivalry on defense decisionmaking, and what kinds of institutional and procedural circumstances within the federal government encourage or discourage such rivalry? Interservice rivalry has been viewed with mixed feelings on the part of defense policy analysts. On the one hand, neatened interservice conflict has been scored as a wasteful misallocation of organizational resources and has been charged with injecting a high degree of emotionalism into a decision process whose security implications place a premium on reasoned and calculated decisions. This same rivalry has been credited with fostering innovation and forward-looking planning on the part of organizations which might otherwise resist such innovation as a result of an over-dependence upon tradition and fixations with military tactics and strategies of the past. If the ABM case offers any lesson concerning interservice rivalry, it would appear to be this: If an administration has as a major political problem the difficulty associated with having annually to reject large military expenditure requests, then interservice rivalry may in fact facilitate
such rejection. The Eisenhower administration, while forced to suffer the political consequences of heated defense policy debates on many issues, was able nonetheless to use interservice antagonisms as a means of tempering military dissatisfaction with smaller-than-desired budget allocations.

Major military rivalries over missions and programs led to an environment in which a service's own dissatisfaction with DOD rejection of budget requests was offset in part by similar treatment of the budgets of the other competing services. In this situation, with the services viewing the budget process as a competition for a fixed level of resources, an administration was able to deal with the pressures for larger defense budgets by playing off the services one against another. What happened in the 1960's was that Robert McNamara's strong leadership in the Defense Department, plus a somewhat more flexible defense budget ceiling, led to a shift in service attitudes toward the budget process. What evolved was a greater interservice tolerance of one another's program requests, and the Joint Chiefs of Staff were better able to negotiate unified positions among themselves prior to arguing service requests to OSD.

If there has been in the ABM debate a feeling that each succeeding year increased the probability that an ABM would be deployed, then the growing JCS unity on the issue--the gradual disappearance or suppression of interservice rivalry on ABM policy--must be recognized as a major factor in such a trend. Both general
USD policies (reluctance to fund major new strategic weapons such as ABM, AAMS, or a new ICBM) and particular budgetary devices (the damage-limiting "package" concept, for example) may be cited as procedural actions which led to decreased interservice rivalry, and in turn influenced the politics of defense decisionmaking.

III. What have been the major shifts in American strategic thinking in the 1960's, and how have these changes influenced the United States' acquisition of strategic weaponry? The history of the ABM debate is in part a history of the controversy over the relative merits and feasibility of defense through deterrence of attack versus defense (should deterrence fail) through actual physical means of protection. There has developed a philosophical dichotomy between the two concepts (which are not necessarily mutually exclusive), and proponents of strategies which emphasize defense have been accused of advocating policies which weaken the nuclear deterrent and thus make nuclear war more likely. Such an accusation has a ring of moral indignation, and the advocates of ABM systems, like the supporters of civil defense, bomber defense, and counter-force strategies before them, have suffered from such criticism. At the heart of the difficulties faced by the proponents of active defenses were the dual problems of high costs and low effectiveness levels associated with both aircraft and ABM defenses. The U.S. expenditure of some $30 billion for its bomber defenses had not yielded as effective a shield as had been hoped for, and technical uncertainties concerning ABM performance led many strategists to view
missile defense based upon the technology of the 1950's and early 1960's as a waste of scarce resources.

The deterrence-defense controversy is indeed a central portion of the strategy debate as it applies to the ABM issue. Perhaps the major shift in that debate so far as ballistic missile defense is concerned was the realization in the mid-1960's that population defense, while seemingly futile versus the Soviet threat, might indeed be feasible against less massive and less sophisticated strategic forces such as those attainable by nations like Communist China. This boost in the status of strategic defenses was reinforced by the development of ABM systems which could offer moderate protection against unsophisticated ICBM forces for relatively moderate costs. The emphasis in U.S. nuclear strategy has by no means shifted to an advocacy of large-scale expenditures for active defenses--deterrence through retaliatory threat remains the cornerstone of that strategy. However, the Chinese threat and the advent of "thin" area defenses has acted to improve the position of those favoring acquisition of ABM systems for the United States.

IV. What has been the result of the institutionalization of expert technical advice in the federal bureaucracy, and how has such expertise interacted with non-technical judgments in the political process? Questions of technical feasibility and operational effectiveness have been central to the ABM debate, although
traditional military emphasis on non-technical arguments in supporting weapons requests meant that such technical issues generally had to be raised by individuals outside the services. This was indeed the case, as technical advisors in civilian DOD positions and experts from outside government challenged the Army's various ABM programs. These men argued that there were many complex uncertainties associated with ballistic missile defense, and that any one of these uncertainties could have fatal implications for ABM performance. The SPUTNIK experience led to the creation of a number of institutions and organizations which brought these same technical experts an increased measure of political stature in defense policy debates. Specifically, the creation of an independent Special Assistant for Science and Technology at the White House level and the DOD reorganization which fostered DDR&E and ARPA insured that Army ABM proposals would be scrutinized annually by scientists whose loyalties did not lie primarily with that service or its industrial contractors. In addition to their technical competence, these scientists brought to the policy process their own values regarding national security and strategic weapons. One such value which was widely held within the scientific community was a desire for substantive U.S. initiatives in the area of arms control and disarmament. This deep commitment to the idea of lessening the likelihood of nuclear war became a central aspect of the ABM debate.

V. What has been the role of systems analysis in the defense
policy process, and how have different types of analysis yielded different assessments of the utility of particular kinds of weapon systems? Systems analyses represented major aspects of Robert McNamara's annual scrutiny of the U.S. strategic force structure, and such analyses provided detailed evaluations of the potential utility of various ABM systems and configurations, according to specific criteria of effectiveness. Because the inputs to these analyses—the choice of such criteria and selection of cost and performance data—can be the determining factors in a weapon system's showing, it is important to understand the specific kinds of analyses which played central roles in the ABM debate. OSD's Office of Systems Analysis performed at least two basic types of systems analysis which were then used in the decisionmaking process to examine ballistic missile defense.

The first such type was the "damage limiting" study. These analyses compared various systems and strategies capable of reducing industrial and population destruction in a nuclear attack. The major impact of the OSD analyses of this type was the demonstration of the fact that protection of significant percentages of U.S. population necessitated extremely large ABM expenditures when the enemy threat postulated was that of the Soviet ICBM force. The second kind of analysis, the "assured destruction" calculations, investigated alternative techniques for assuring the maintenance of a credible second strike force as a deterrent to Soviet nuclear
attack. These studies served to emphasize the many uncertainties associated with ABM performance. By comparing hardpoint Ad" deployments to alternatives such as increased numbers, hardening, or dispersal of offensive weapons, the assured destruction calculations indicated that ballistic missile defense systems were much less reliable devices than were these other systems.

Systems analysis has been alternatively praised or blamed for the nature of strategic weapons policy in the United States since 1961. Regardless of one's feelings as to the correctness of that policy, it may be said that the various analyses conducted to examine strategic forces did act to structure the defense policy debates on these issues, and did allow the protagonists in those controversies to address the specific values, assumptions, and preferences basic to the debate. It was the philosophy of examining costs and benefits in a rigorous manner, rather than the outcome of any specific systems analysis, which made the most significant impact in the policy process. It was the continuous process of explicitly asking what one's goals were and how best to fulfill them with the resources available which made the atmosphere of defense decisionmaking in the Kennedy and Johnson administrations different than it had been in the 1950's.

THE FUTURE OF THE ABM ISSUE: LESSONS FROM THE PAST DEBATE?

September 18, 1967, by no means marked the end of the ABM debate. As this chapter is being written, the ABM issue is once
again being examined by the United States government, and administration and Congressional officials continue to debate the merits of ballistic missile defense. In the months between the fall of 1967 and the spring of 1969, critics of ABM deployment made major efforts to reverse the decision authorizing production of the SENTINEL system. The center of this continuing debate has been the United States Senate, and ABM opponents sought to halt SENTINEL through rejections of the budgetary appropriations needed to construct the system. This eighteen month time period has seen two instances within the debate which are particularly relevant to this study's examination of the political processes attendant to the ABM deployment issue.

In the spring of 1968, a bipartisan group of Senators led by Kentucky Republican John Sherman Cooper and Michigan Democrat Philip A. Hart introduced an amendment to the FY1969 DOD appropriations bill calling for a one year postponement of funding for the SENTINEL system. Although this measure was defeated by a vote of 52-34, the Senators demonstrated that opponents of ABM deployment could marshal significant support. 47 Within days of the Senate vote, Soviet Foreign Minister Andrei Gromyko announced

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his nation's willingness to begin substantive strategic arms limitation talks. Both sides of the ABM debate immediately took credit for prompting the Soviet response. SENTINEL advocates argued that it was the Senate's resolve to build an ABM which led to Moscow's action, while supporters of the Hart-Cooper bill claimed that it was the legislators' demonstration of serious concern regarding the arms race implications of ABMs which elicited Gromyko's announcement. 42

Communications between the two great nuclear powers continued throughout 1968, but no agreement was reached regarding a format for substantive talks. Perhaps the Soviet Union's slow pace in this area was prompted by the realization that 1969 would find the U.S. with a new president. While Moscow apparently wanted to await the outcome of the November election prior to instituting the talks, President Johnson sought to secure a beginning to arms talks prior to his leaving office. Republican presidential candidate Richard Nixon campaigned in support of an ABM system for the U.S., and Johnson administration officials indicated a belief that SENTINEL would provide a useful bargaining tool in any subsequent arms limitation talks with the U.S.S.R. This view was expressed publicly

MINUTEMAN force, even in the face of potential improvements in Soviet offensive capabilities. The Nixon administration had done what the Johnson administration had consciously avoided doing with regard to presenting the thin ABM deployment, namely, it had tied that system directly to the issue of U.S.-Soviet strategic arms relationships.

The Senate and segments of the public continue to debate the issue, and both the Senate Armed Services and Foreign Relations Committees have held lengthy hearings on the SAFEGUARD proposal and its implications. This continuing controversy has prompted this author to conclude the case study with an observation about the future of the ABM debate and the value of this kind of case analysis in illustrating the nature of defense decisionmaking. For this student of the policy process, the two most difficult events to explain in the history of the ABM debate are the two presidential decisions—Johnson's in 1967 and Nixon's in 1969—in favor of deployment of such a defense. Can the policy analyst provide anything approaching a predictive capability regarding such decisions, and what are the major considerations in constructing such analyses?

It is this author's belief that this kind of case study can provide a basis for predicting with relatively high probability of success the outcomes of various U.S. government decisions to deploy or not to deploy an ABM, so long as the deployment decision is addressed in the context of that portion of the policy process dealt with in the study. This analysis deals primarily with the Defense
Department and the DOD budget process, and so long as ABM deployment is examined by a Secretary of Defense or a President in the context of defense policy considerations, then such prediction can be based upon the kinds of documentation presented here. However, if and when the issue is addressed by the President in terms of a perspective which is at variance with the central considerations bearing upon defense policy, there is then no guarantee that this type of case study can allow the policy analyst to anticipate the nature of any subsequent decision.

President Johnson's apparent rationale for choosing to deploy SENTINEL, while related to a key aspect of the ABM "defense policy" debate (i.e., the arms control issue), was nonetheless somewhat removed from the kinds of national security objectives—defense against China, MINUTEMAN protection, superiority over the U.S.S.R., etc.—which were present as DOD and the Congress debated ballistic missile defense in 1967. A reader of this study may have, after reading Chapters Nine and Ten, felt secure in predicting that a deployment approval was forthcoming in 1967. However, it is highly questionable as to the success that reader could have in specifying why such a decision was taken. If Chapter Eleven's interpretation of the President's motivation for his decision is accurate—and this author feels that the interview documentation in this case is accurate and reliable—then the prevailing public interpretation of Johnson's motivation merely illustrates the predictive difficulty noted above.
Because of the context of the ABM debate in 1966 and 1967—a context documented here—the President's SENTINEL decision has been widely interpreted as an "anti-Republican" deployment. Indeed, Chapters Nine and Ten could stand as a basis for this kind of prediction and explanation. Accepting the interpretation presented in Chapter Eleven, however, where is the policy analyst left in his desire to predict policy on the basis of detailed case analyses? Why did President Johnson's decision create a problem in understanding in the analysis of the ABM issue? In this author's view, the source of the problem is neither novel nor difficult to understand. A solution, however, necessitates new capabilities for dealing with issues of public policy.

This case study's basic inability to prepare its readers to anticipate the context and substance of Johnson's June, 1967, decision to deploy an ABM springs from a basic reality of presidential perspective. As Richard Neustadt has illustrated in his Presidential Power, the man in the White House maintains a political perspective which is unique to that institution. The SENTINEL decision is an example of that perspective: This issue was addressed not on "defense policy" terms, but through this "presidential perspective."

From 1957 through 1966, ABM deployment decisions were handled for the most part on "defense policy" terms, and even when these choices

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45. Neustadt, Presidential Power, Chapter 8, "The Sixties Come Next."
were brought to the White House level, "presidential perspective" yielded decisions which were essentially congruent with the perspective of the Secretary of Defense or other relevant advisors on defense policy. For these instances, then, this study appears able to suggest the context and even the outcomes of the particular choices on ABM policy.

How does the analyst deal with the problem of presenting this unique perspective and distinguishing it from other aspects of the decisionmaking environment? As Neustadt's book demonstrates, one can, given time and access, document the presidential perspective. This study's problem in explaining the Johnson decision is in part derived from its conscious decision not to spend a significant amount of effort documenting that perspective.46 And, as Chapters Two through Ten hopefully demonstrate, such documentation is not a prerequisite to the descriptive task so long as decisions are taken in the context dealt with in the case study.

The policy analyst's problems are not solved, however, by a simple admonition to broaden each study's coverage of potentially relevant considerations and perspectives which may impinge upon

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46 Problems arise too when analysts attempt to describe presidential perspective after only a limited examination of the man's motives and values. The "anti-Republican missile" interpretation of Lyndon Johnson's ABM deployment is in part a result of the stereotyping of presidential perspective. The "Texas wheeler-dealer" image does in fact appear to describe a major portion of Johnson's personality and orientation to issues, but that argument seems to represent an overgeneralization in the ABM case. The New York Times' James Reston was perhaps the leading example of those who interpreted the SENTINEL decision as primarily an effort to prevent the Republicans from creating a "gap" issue in the 1968 elections. See his "Washington: The Anti-Republican Missile," New York Times, September 22, 1967.
particular decisions. The researcher operates under resource constraints, and would prefer to omit detailed documentation of factors whose relevance to the central subject matter is uncertain or tangential. The question which we would like to be able to answer in light of these circumstances is this: How and why do particular issues find themselves lifted out of an original context and made the subject of presidential perspective? What clues are available to indicate, for example, that Lyndon Johnson would treat ABM deployment differently in 1967 than he had in previous years? Even if one understands the "presidential perspective," how does he determine when and how issues will be decided through that perspective?

There is no easy answer to these queries, but there are two kinds of clues which may indicate the kinds of factors which the policy analyst should scrutinize. Presidents play many roles, and alternatively act as "party leader," "domestic leader," "statesman," etc. One clue to the nature of presidential perspective--and thus to the possible context of particular policy decisions--comes through understanding of the chief executive's own preferences among these roles and his acceptance of various values associated with the roles. Lyndon Johnson has been characterized as the supreme political actor, a man who was constantly aware of the relationship between his actions and his subsequent influence among a number of different "audiences." He also held as a primary value the idea of attaining peace through control of nuclear weapons, and this is evident in
Johnson's deep commitment to such things as the nuclear nonproliferation treaty and the treaty to ban the use of nuclear weapons in outer space.

The combination of these two elements of presidential perspective, strong awareness of political stature and concern for nuclear arms control, constitutes the framework for President Johnson's ABM deployment decision as described here. The combination of Republican clamor and Soviet refusal to consent to arms talks in June, 1967, is thus a strong clue that the ABM issue might rise to the level of "presidential perspective." These two circumstances—Republican criticism and Soviet reticence—had been present for some months prior to June, however. Given these trends, why was June, 1967, any more likely to be the time of decision than, say, January, 1967? Neustadt provides a second clue, one which can perhaps answer this particular questions.

Presidential time and attention are extremely limited resources, and chief executives consequently tend to avoid making decisions unless forced to act by deadlines.\footnote{Neustadt, p. 155.} If in the course of an issue, one may cite a date or an event which constitutes such a deadline, then perhaps the analyst can predict the specific time frame for the President's action. In the ABM case, Glassboro represents just such a deadline. It was not until that event that Johnson was forced to
admit that his efforts at arms talks had failed, at least in the short term. With that admission, he was forced to act with regard to the dual issues of the Soviets and the Republicans.

Hindsight is a wonderful thing, and this author is not convinced that the kinds of clues described here can in many cases lead the policy analyst to answers to the questions posed above regarding presidential perspective. An extension of this study to include the March, 1969, ABM decision by Richard Nixon could yield additional insight into these issues. The policy process is a dynamic mechanism, and today's analyses may hold little relevance to tomorrow's decisions. Whatever else one may say about the ABM issue, it is a safe prediction to claim that it will remain a major point of debate in American defense policy. This case study has hopefully answered some questions about that debate, and raised in the course of its analysis new questions of importance both for policy analysts and policy makers. Security is an elusive thing, and the dangers of a nuclear world demand that policy analysts, policy makers, indeed, all of us, continue to scrutinize these questions.
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ABM--- Anti-ballistic missile.

active defense--- Defensive measures which operate by actually attacking and destroying enemy offensive weapons.

AMSA--- Advanced manned strategic aircraft. The proposed follow-on strategic bomber, to replace the B-52 in the U.S. inventory.

area defense--- Defensive systems whose range and configuration allow single units to protect large sections of territory.


ASW--- Anti-submarine warfare.

blackout--- The disruption of radar and communications equipment resulting from certain types of electronic interference, especially that interference caused by nuclear weapons detonations.

BMEWS--- Ballistic missile early warning system, a radar and communications system deployed near the arctic circle to provide warning against missile attack from the U.S.S.R.

CIA--- Central Intelligence Agency.

DDR&E--- Directorate of Defense Research and Engineering.

DEW Line--- Distant Early Warning Line, a system of radars deployed in North America to provide warning against Soviet bomber attack.

DIA--- Defense Intelligence Agency, a Defense Department organization which integrates the intelligence gathered by the various military intelligence organizations.

discrimination--- The process of distinguishing among objects in ballistic flight so as to determine the identity of actual nuclear warheads as distinguished from decoys and artificial warheads.

DOD--- Department of Defense.
Glossary of Selected Terms
and Abbreviations

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DOD--- Department of Defense.
DPM--- Draft Presidential Memorandum, an annual Defense Department policy document submitted to the President. There are a number of these each year, covering various sections of the defense budget plus selected special policy issues.

EMP--- Electromagnetic pulse, energy created by nuclear explosions which can damage or destroy electronics gear by generating excessive current levels.

exoatmospheric--- Above the atmosphere. Used to describe long-range ABM systems.

FAS--- Federation of American Scientists, an organization which has been active in the ABM debate for a number of years.

FY (as in FY68)--- Fiscal Year.

GTE--- Greater-than-expected threat. A planning tool used by the Office of the Secretary of Defense to anticipate possible U.S. weapons requirements in situations where enemy force structures evolve more rapidly than predicted by current intelligence estimates.

hard--- Refers to weapons or structures built to withstand high levels of blast overpressure and shock such as is generated by a nuclear blast.

hardpoint defense--- The defense of hardened weapons or installations (e.g., missiles in underground silos or command posts located underground) through a terminal ABM system.

ICBM--- Intercontinental Ballistic Missile.

IDA--- Institute for Defense Analysis. A non-profit research organization which operates under contract to the Department of Defense.

IRBM--- Intermediate-Range Ballistic Missile.

JCAE--- Joint Committee on Atomic Energy.

JCS--- Joint Chiefs of Staff. Used here to refer both to the service chiefs and to the staff organization which serves these service leaders.

MAR--- Multifunction Array Radar. A large phased array radar designed for use as a part of the NIKE-X ABM system.
MIRV--- Multiple Independently Targetable Reentry Vehicle. An ICBM warhead containing more than one nuclear weapon, each of which may be guided to a different target.

MSR--- Missile Site Radar. A small phased array radar designed to control a single battery of ABM interceptors.

neutron flux--- Emission of neutrons by a nuclear explosion. This flux is capable of destroying certain types of electronics equipment and of damaging other kinds of materials if these materials are relatively proximate to the explosion.

NIE--- National Intelligence Estimate. An annual CIA-DIA summary of enemy forces, structures and apparent future capabilities.

Nth Country--- A term referring to nations attaining a nuclear weapons capability.

OSD--- Office of the Secretary of Defense. The organization which provides staff work for the Secretary of Defense.

PAR--- Perimeter Acquisition Radar. A long range phased array radar used in U.S. ABM systems.

passive defense--- Defensive measures (fallout shelters, etc.) which do not physically attack offensive weapons, but instead shield against damage caused by them.

penaid--- Penetration aid. Devices or tactics designed to confuse defense systems and allow offensive systems to carry out attacks without attrition from such defenses.

point defense--- Defensive systems whose range and configuration yield a capability to defend only the immediate area, i.e., within a few miles of the defensive installation.

precursor blast--- A tactic of detonating large nuclear warheads at high altitude above an enemy's territory so as to disrupt defense radars and communications, allowing subsequent offensive weapons to penetrate these defenses.

PSAC--- President's Science Advisory Committee. A group of private scientists who advise the President on matters pertaining to science and technology.
RV--- Reentry vehicle. The final stage of a ballistic missile, designed to carry warheads and/or decoys back into the earth's atmosphere and onto enemy targets.

SAGE--- Semi-Automatic Ground Environment. A communications, command, and control system designed to integrate U.S. radar systems and anti-aircraft systems (both missiles and aircraft) to intercept enemy bombers.

saturation--- The tactic of defeating an enemy defensive system by delivering more objects—warheads and/or decoys—than the defense's radars, computers, and interceptors can handle.

second strike--- Retaliatory attack in response to an enemy attack. "Second strike" capability implies the possession of weapons whose numbers and/or low vulnerability to enemy attack would yield survival of an acceptable number of weapons even should such an enemy surprise attack take place.
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