Chapter 11

DIVERSITY OF U.S. STRATEGIC FORCES

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OVERVIEW

Among the many considerations that arise in the selection of a basing mode for the MX missile is the perceived need to maintain diverse U.S. strategic offensive forces. For the past 20 years, the United States has deployed a "Triad" of strategic offensive forces— intercontinental ballistic missiles (I CBMS), submarine launched ballistic missiles (S LBMS), and manned bombers—with each "leg" of roughly equal importance. While the development of these strategic offensive forces did not occur as a result of a conscious policy for the procurement and use of strategic nuclear weapons, the diverse operational characteristics of U.S. strategic forces described briefly below have stimulated the formulation of American nuclear strategies and tactics that seek to optimize the differing capabilities and vulnerabilities of each leg of the Triad.

The following discussion assumes that no matter what basing mode is selected for the MX missile, the United States will also deploy future strategic offensive forces composed of Minuteman ICBMS, manned bombers, and SLBMS on both Poseidon and Trident fleet ballistic missile submarines (SSBNS). For purposes of OTA'S analysis, the MX missile is regarded as an additional strategic nuclear weapons delivery vehicle, rather than a substitute for any existing U.S. strategic offensive nuclear weapon. This assumption is consistent with existing or proposed Defense Department plans.

MX deployed on land in such modes as multiple protective shelters (MPS), defended MPS, defended silos, and in silos relying on launch under attack would continue to provide the United States with hedges against changes in the technological environment of strategic forces. Any of these modes would limit the effects of failures of American technology encountered in the modernization of the bomber and SLBM legs of the existing Triad. These land-based MX basing modes would continue to provide a hedge against Soviet defenses, and would retain the present characteristics of U.S. strategic offensive forces that make it impossible for the Soviets to plan and execute a preemptive attack against them with high confidence. The land-based MX basing modes would also retain those attributes of strategic offensive forces commonly thought to be the strong points of existing ICBM forces.

Small submarine basing for the MX missile would guard against some changes in the technological environment but not against others. If the Soviet Union were to suddenly develop and deploy an unexpected antisubmarine warfare capability, it might be effective against Poseidon and Trident submarines as well as small submarines carrying MX missiles; there is also a risk that problems with other U.S. submarine construction programs might apply to, or be exacerbated by, small submarine construction. Small submarines could acquire military capabilities quite comparable to land-based MX deployment options. While land-based systems would be somewhat more accurate, OTA'S analyses do not clearly indicate that the differences in accuracy would have militarily significant practical implications.

There is a controversy over whether increasing the importance of sea-based as opposed to land-based strategic forces would strengthen or weaken deterrence.

Air mobile MX would share a common failure mode with the bomber force, but it would not be targetable by Soviet ICBMS.

DIVERSITY AND VULNERABILITY

Maintaining three completely different types of strategic weapons delivery systems over the past 20 years has provided the United States with an insurance policy of sorts against sudden and unforeseen technological developments. Diversity complicates Soviet efforts to plan and execute a preemptive attack on U.S. strategic forces with high confidence of success.

Diverse U.S. strategic forces complicate Soviet use of air defense, antiballistic missile defense or antisubmarine warfare to prevent destruction of their homeland in the event of an attack by the United States. Diversity in U.S. strategic forces necessitates the division of Soviet offensive and defensive capabilities among several distinct missions, thereby diluting the resources that can be applied to any one mission. The possibility of a sudden and unanticipated technological Soviet development rendering any leg of the U.S. Triad of strategic offensive forces is therefore reduced. Even if the Soviets developed an ability to defend themselves against one leg of the U.S. Triad, other legs could still carry out their strategic missions.

Hence, one criterion that might be used in comparing and contrasting various MX basing modes is the degree to which each basing mode would provide a hedge against vulnerability as a result of the technological change.

MX deployed in an MPS basing mode with or without a low altitude defense system satisfies this criterion, assuming that preservation of location uncertainty (PLU) is maintained and the MX/MPS is deployed on such a large scale that the Soviets lack the number of reentry vehicles (RVS) necessary to confidently attack each MPS. Under these conditions, MX/MPS would provide a hedge against technical problems that might be experienced during the modernization of the manned aircraft and submarine legs of the Triad. The proliferation of targets in the United States would make it significantly more difficult for the Soviets to plan and execute a preemptive attack against U.S. strategic offensive forces. Timing and coordinating an attack against 4,600 MX shelters, approximately 1,000 ICBM silos, bomber bases, and the submarine force with high confidence of success would be a virtually impossible task.

MX/MPS might share a vulnerability to Soviet ABM systems with other U.S. ICBMS or SLBMS. However, the deployment of a large MX/MPS system would stress Soviet defense resources in at least two different ways. First, the Soviets would have to invest heavily in the fractionation of their own RVS in order to acquire the number needed to destroy each shelter with high confidence. Second, the Soviets would have to invest in remote sensing, clandestine sensors, and espionage if they were to attempt to compromise PLU. The magnitude of these investments might make it difficult for the Soviets to pursue other strategic programs with the same vigor and commitment of resources possible in the absence of MX/MPS.

Deployment of MX missiles on small submarines provides a hedge against some kinds of technological change. If a sudden and unanticipated technological development in the field of antisubmarine warfare were to occur, and if this development were to simultaneously threaten the Poseidon/Trident force as well as the small submarine/MX force, considerable diversity in U.S. strategic forces would be lost. However, the small submarine basing mode examined by OTA would add considerable diversity to the U.S. strategic missile submarine force. Since the nature of a sudden and unforeseen hypothetical breakthrough in Soviet antisubmarine warfare capabilities cannot be predicted, it is impossible to judge the extent to which diverse submarine types would complicate or frustrate Soviet antisubmarine warfare.

Moreover, deployment of MX missiles on small submarines might not provide an adequate hedge against problems encountered in

WIlliam J Perry, *The F/sea/ Year* **1981 Department of** *Defense Program for Research, Development, and Acquisition* **(Washington, D C Department of Defense, 1980), p VI-1**

future U.S. submarine construction programs. Present submarine construction facilities in the United States are backlogged and plagued by management problems. ' If these problems cannot be solved, small submarine deployment of MX missiles might not be an acceptable hedge against technical problems or delays in the deployment of Trident submarines in the late 1980's. The importation of modern, proven diesel-electric submarine technology from our North Atlantic Treaty Organization (NATO) allies might provide a hedge against continued problems in U.S. submarine construction programs.

Air mobile MX could be subjected to attack on the ground just as the manned bomber force might be. In the absence of adequate warning, both the bomber and air mobile MX force could be destroyed. Air mobile MX would hedge to some degree against improvements in Soviet air defenses that might jeopardize the effectiveness of air-launched cruise missiles or a new penetrating bomber. It would stress the ability of the Soviet Union to deploy a large number of SLBMS close to the continental United States, a capability they do not have today. It would not be targetable by ICBMS.

Deployment of MX in silos and reliance on a doctrine of launch under attack (LUA) completely fails to meet this criterion. MX/LUA would share a common mode of failure with the present Minuteman force that is thought to be vulnerable to a Soviet preemptive attack should there be a failure in warning or communications systems.

"'Statement of Adm Earl Fowler," U S Congress, House Committee on Armed Services, Mar 12, 1981

DIVERSITY AND WEAPONS SYSTEM CAPABILITIES

Present U.S. strategic doctrine emphasizes the continuing need for strategic offensive forces that contribute to the deterrence of war by virtue of their diverse military capabilities. As Gen. David Jones, Chairman of the Joint Chiefs of Staff noted in his report to the Congress for fiscal year 1982:

> The primary purpose of U.S. strategic nuclear forces is deterrence. To insure deterrence, **these forces must be capable of executing national strategy under all conditions — no matter what the challenge, no matter what tactics an opposing force may choose. While a force composed of a single delivery system could be optimum in certain situations, the United States faces an international environment of diverse threats to national security. To deal effectively with this wide range of strategic uncertainties, U.S. strategic nuclear forces are structured around an array of independent capabilities which can confront any level of nuclear threat.** [3]

There is a wide range of military capabilities believed to be needed for effective deterrence. The ICBM leg of the Triad has been considered superior to other legs of the Triad in several of these military capabilities in the past.[4] These military capabilities include the following:

- accurate delivery of nuclear weapons (accuracy);
- the ability to carefully control the time at which a nuclear weapon arrives on its target (time-on-target control);
- the ability to change targets assigned to specific strategic nuclear weapon delivery vehicles rapidly (rapid retargeting);
- the ability of strategic forces to respond quickly to attack orders (rapid response); and
- the ability to use a small number of strategic nuclear weapon delivery systems in a flexible, limited manner (flexible use).

'Cen **David Jones,** *United States M//ltary Posture for Fiscal Year 1982* (Washington, D C Department of Defense, 1981, P 69

"Wlllam) Perry, The *f/sea/ Year* **/982** *Department of Defense* Program for Research, Development, and Acquisition (Washington, D C Department of Defense, 1981, p Vi-l

Accuracy is necessary to attack targets that have been especially designed to withstand the effects of nuclear weapons. Such targets might include missile silos, communications facilities, specialized industrial facilities, and hardened military facilities.

Time-on-target control is required to prevent the earliest arriving nuclear weapons from destroying subsequent weapons in a multiple weapon attack against a specific target. Time-on-target control may also be required in certain attack tactics in which the destructive effects of nuclear weapons are compounded through use of multiple, closely spaced weapons against adjacent targets.

Retargeting of nuclear weapon delivery systems is desired in those cases where the President chooses an attack option from a menu of preplanned attack options or alternatively decides to attack a specific target that might not be included in a particular attack option. The ability to retarget a strategic nuclear weapon delivery vehicle may also be required in the event that some portion of the force is destroyed and a retaliatory attack against important targets is ordered. Retargeting of surviving forces would be necessary to ensure that high-priority targets would be attacked by surviving forces.

Rapid retargeting is desired to give the President more options as new information is provided about the scope, magnitude, and apparent political objectives of an attack, or alternatively, to permit maximum flexibility in the use of a force as it suffers attrition during the course of an attack against it.

Rapid response to launch orders, referred to as Emergency Action Messages, may be desired in order to take advantage of current intelligence about the disposition of high-value targets. Rapid response may also be desired in the event that an attack against U.S. forces is detected, thereby permitting the launch of forces prior to their destruction.

Flexibility for limited attacks may be desired so that political decision makers can attempt to control the pace of escalation, trying to limit the scope and magnitude of a nuclear war to a level less than all-out or cataclysmic war.

Comparison of various MX basing modes against these desired weapon system capabilities leads to the following observations.

MX deployed in an MPS mode with or without defense, in defended silos, or in silos relying on launch under attack would retain and increase the military capabilities of the presently deployed ICBM leg of the Triad of U.S. strategic offensive forces in terms of accuracy, time-on-target control, rapid retargeting, rapid response, and flexibility for limited attack.

Small submarine-based MX would also expand the military capabilities of U.S. strategic forces and could come quite close to the land-based MX basing options. While small submarine based MX would not have accuracy quite as high as land-based MX, the difference between the two could be so small as to be of little practical consequence unless time-urgent hardened targets of interest in the Soviet Union were significantly more resistant to nuclear weapon effects than currently believed.

Time-on-target control for small submarine based MX missiles could be comparable to land-based missiles if the command and control system deployed to support small submarine-based MX permitted communication of information needed to plan and execute such attacks.

Rapid retargeting of small submarine-based MX missiles could be comparable to land-based missiles. Retargeting of MX missiles deployed on small submarines to take attrition of the small submarine force into account could be more difficult than would retargeting of land-based MX missiles; however, attrition of small submarines appears far less likely than attrition of the land-based MX force.

Small submarine-based MX missiles could have response times comparable to land-based MX if the communications systems supporting them were properly designed and implemented. They would have very great flexibility for use in limited nuclear exchanges. Unlike

larger Poseidon or Trident submarines, use of an MX missile from a small submarine would compromise the location of only a small fraction of the MX force on station at any given time. Were one MX used, only three additional MX missiles would be placed in jeopardy, as compared with **15** Poseidon missiles or 23 Trident missiles in the event that one missile were to be launched from the larger submarines. On the other hand, the launch of one land-based MX missile exposes no additional missiles to possible immediate counterattack.

Air mobile and surface ship mobile MX might not be quite as accurate as either land-based MX or small submarine-based MX missiles. In addition, the need for aircraft carrying MX missiles to take off and reach altitude to drop missiles or surface ship carrying MX missiles to deploy to areas within range of land-based missile navigation aids would substantially reduce their ability to exercise time-on-target control and responsiveness. Furthermore, these operational requirements might provide the Soviets with strategic warning of a pending American attack.

Surface ship mobile would provide considerably less flexibility for limited use, given that the use of one MX missile would compromise the location of large number of unused missiles carried aboard the surface ship.

DIVERSITY AND DETERRENCE

There is a wide range of views on the differences among various basing **modes for the MX missile** in terms of continued maintenance of strategic nuclear deterrence. The following discussion summarizes the major points of view.

One view holds that the United States must retain a substantial portion of its most militarily capable strategic forces on the continental United States in order to effectively deter the Soviet Union from initiating attacks on either the United States or our allies. Russell E. Dougherty, retired Commander in Chief of the Strategic **Air** Command, summarized this view:

> **attacking the MX or any other land-based ICBM located in the American heartland forces an aggressor into the open. There can be no ambiguity about an attack of the magnitude required to blunt even a small portion of the U.S. ICBM force. Such an attack would involve a very large number of ICBM warheads with a flight time of about *30* minutes from Soviet launch sites to U.S. targets. The attacker knows that the intended victim knows with certainty and in some detail that a strike has been launched.** The attacker also is aware that the victim has enough time to react to this unambiguous act, and probably will. [5]

Hence, deployment of the MX missile on land drives up the threshold of attacks on the United States, risking perhaps millions of American civilian casualties, and, at least in this view, assuring American retaliation. Deployment of air mobile MX would have similar consequences were the Soviets to attempt to attack this mode.

Another view holds that deployment of the MX on the continental United States is politically important in the context of broader U.S. efforts to win support for NATO theater nuclear forces modernization and promotion of meaningful negotiations for Mutual and Balanced Force Reductions in Europe.

Adherents to these views tend, therefore, to look with disfavor on the deployment of MX missiles on either small submarines or surface ships arguing that retention of the current balance of capability among land-, sea-, and air-based legs of the Triad is essential to the maintenance of deterrence.

Others believe that the United States need not create additional targets on the continental United States with the selection of a basing mode for the MX missile. Retention of Minuteman ICBMS, bomber bases, submarine bases, and the addition of shore support facilities for either small submarine basing of MX missiles

[5] Russell E Dougherty, "The MX Missile System – Keystone of a Modern Strategic Nuclear Force, " *A EI Foreign Policy and Defense Review,* VOI **2, No 6,** December 1980, p 7

or surface ship mobile MX would still force the Soviets to expend a sufficiently large fraction of its strategic forces to make clear its intent.

Deployment of MX missiles at sea, it is argued, reduces the amount of damage that might be done to the United States as a result of radioactive fallout from an attack on MX/MPS, MX/defended MPS, air mobile MX, or silo-based MX. As a result deterrence could be strengthened because the United States would be better able to exercise escalation control with less of its population at risk as a result of the MX basing at sea.