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The U. S. ICBM Force: Current Issues and Future Options (U)

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PREFACE

This is a summary perspective of the U.S. ICBM force. The purpose is to provide decisionmakers at all levels with a short but comprehensive background appreciation of the key issues and options that have become associated with land-based ICBMs. The material should be useful in helping to support a wide range of decisions affecting the future composition of the U.S. ICBM force. While the individual topics are not developed in detail sufficient for specific decision situations, they do cover a span of concerns and alternatives going beyond what is usually found in any single report or briefing on the force.

Providing a short yet comprehensive review has enforced some economies in the selection of material. Since the intended readers are likely to have more than a pedestrian knowledge of ICBMs, the aim is to remind rather than to educate. The tutorials are limited to those issues and options that seem to pivot on details not widely discussed in the open literature. The discussions do not go very much beyond the U.S. ICBM force, even though many of the subjects invite, if not demand, broader consideration of related topics such as the Soviet ICBM force, alternative strategic forces, and national security objectives. These related topics are omitted unless they seem peculiarly relevant to the U.S. ICBM force. It is presumed that the audience is familiar with these broader questions.

The report was prepared as a task on the continuing Project RAND study entitled "Future Strategic Aerospace Force Requirements."

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SUMMARY

This report presents a broad review of issues and alternatives bearing on the future of the U.S. ICBM force. The purpose is to provide a background understanding and a perspective to help support decisions on force structure and deployment. The historical evolution, current status, and ongoing plans for the force are briefly summarized, serving as a compact reference source and introduction to the U.S. ICBMs. Issues associated with ICBMs in the public debates are developed, together with outlines of the principal opposing arguments. Future options, beyond those now programmed for the force, are identified and discussed.

At the end the authors present their own subjective assessment of the key issues and options. They hold that the unresolved pivotal issue bearing on the future of the ICBM force is whether or not it will evolve to play any unique roles in our strategic posture. The future does not look promising if ICBMs are viewed simply as an arm of the Triad--one of three ways of doing the same job. The authors believe however that ICBMs could emerge preeminent for special roles in at least four areas. These include ICBMs fitted for limited strategic operations, ICBMs as a cost-effective strategic reserve, ICBMs for counterforce, and ICBMs for "force equivalence."



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V (U) Launch on Attack Assessment. Even if all of the *technical* uncertainties attending prelaunch survivability were resolved, other inherent uncertainties in military and political planning for large-scale counterforce attacks are likely to remain an issue. In addition to the technical uncertainties, the attacker's risks of being preempted (or having the ICBM force launched before the attack is completed) are unquantifiable. One view is that such risks make a deliberate, carefully planned attack incredible; an opposing view holds that such risks are irrelevant in classical deterrence calculations, which are concerned with possibilities more than probabilities.



(U) The mere possibility of the U.S. ICBMs' being launched upon confirmation of a Soviet ICBM attack, even if launch-on-attack assessment is not explicitly adopted as policy, is held by some to pose an intolerable risk in any Soviet contemplation of an effective surprise attack upon the U.S. ICBM force. Even if the Soviets had high confidence in the silo kill capabilities of their ICBM force, it is argued that they could not be sure that their attack would be successful because "the Russians would have to consider that Minuteman might be launched against Russian targets in the 30-min warning time between the launch of the Russian ICBMs and their arrival at the Minuteman silos."^{*}

(U) There are two important aspects to the credibility of this potential capability as a deterrent to the Soviets. One is how the Soviets might judge prospective U.S. actions in the light of our policy statements. The President has rejected "sole reliance on a 'launch-on-warning' strategy" because it "would force us to live at the edge of a precipice and deny us the flexibility we wish to preserve."[†] Whether the Soviets might interpret such policy statements as defining our intentions or not is unclear and can be argued either way.

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(U) Launch on Attack Assessment. A credible capability to launch the ICBM force on attack assessment requires systems for assessing the attack and then implementing appropriate launch command and targeting procedures. The main objectives of attack assessment are: to determine with high confidence that an attack is in progress, to assess the nature and intent of the attack, and to provide decisionmakers that information in time to act. An attack assessment system would consist of surveillance sensors, communication networks, capabilities for near-real-time data processing and display, and capabilities for data integration and analysis. With current sensors, the potentially available information times for attack assessment are shown in Table 4.

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(U) Attack assessment information provides but one input to the ICBM launch decision process. Other inputs may be the prevailing world situation and information available from intelligence sources. As an attack develops over time, assessment information can assume two aspects: First, the strategic nature and purport of the attack (how many attackers, from where, going where, and when?) and, second, the tactical particulars of the attack (which, depending on the quality of the attack assessment system, may include the identity of the specific target, attacker type, and time of impact).

(U) Because of the relatively short times available, a credible decision process must include a preplanned set of decision criteria, involving at least two considerations: (1) the attack assessment thresholds for considering launch commitment, and (2) the level of confidence in assessment information for launch decision. The first may weigh the consequences of launching versus not launching; the second may require, for example, confirmed reports from several information sources of numerous Soviet warhead detonations in the U.S. heartland before the decision to launch is made.



IV. AN ASSESSMENT

The foregoing perspective of current issues and future options for the U.S. ICBM force is intended as an objective background for decision-making. How that background is assessed as foreshadowing the future of the force depends upon some further, subjective considerations:

- What are the *crucial* issues?
- What views are taken on those issues?
- Which of the available options are *responsive* to those views?

Answers to these questions are not necessarily singular; they may vary with people and time. While preparing this perspective, the authors have formed their own judgments on the answers. In this final section, we depart from the summary perspective and present our views and judgments on what all of this implies for the future of the U.S. ICBM force. Thus, this final assessment forms a separate, more subjective part of the report, rather than presenting the conclusions of a quantitative analysis. Our readers may represent a variety of viewpoints; they are encouraged to draw their own conclusions.

We see the most important and pervasive concern to be the preservation of the long-term capability of U.S. ICBMs to deter a preemptive nuclear attack, both in fact and in appearance, in the face of the foreseeable developing threat. The principal source of this concern is the large-scale Soviet deployment of accurate MIRVed missiles that could threaten the survival of U.S. silos.

Averting that possibility by negotiated limitations on MIRVs or throw weights is to suggest that SALT determines the future of the U.S. ICBM force. Avoiding the consequences of the threat either by abandoning the silos or rebasing the ICBMs, implies that a silo-based missile force is one the U.S. can or should do without. To ignore the concern is to deny both the scenario and rationale for strategic nuclear forces. While these futures are extremes which may *bound* the future of U.S. ICBMs, we find them neither attractive nor realistic as solutions.

THE PIVOTAL ISSUE

Instead of boundary solutions, we have sought the pivotal issue that, more than any other, might be a watershed for the future of the force. We submit that such a pivotal issue is whether each of the strategic offensive forces--ICBMs, bombers, or SLBMs--has some *unique role* within the U.S. strategic posture. If the ICBMs are considered simply as one of three different ways of doing the same job, then we are not sanguine about their prospects as key elements of the future U.S. strategic posture. However, if the ICBMs are seen to have a special role in the posture because of their unique capabilities and characteristics, then several interesting alternative futures are evident to us.

Resolution of this pivotal issue hinges not only on the *actual* characteristics and capabilities of ICBMs and on their *actual* role in the strategic posture but also in large measure on public *perceptions* of the job that ICBMs are supposed to do.

To suggest how decisive this issue may be, we offer below two very different prospects for the future of the force, depending upon how the question is resolved.

A FUTURE WITHOUT MUCH PROMISE

If the U.S. ICBM force is viewed as just one of three strategic offensive forces whose principal and common role is to deter a nuclear attack through assured retaliation, then the overriding concern will continue to be the survival of ICBMs in a preemptive attack. Comparisons among the three forces on the basis of survivability are invited simply because it is the basic common denominator of retaliatory capabilities. Other qualities, admirable or not, are likely to be discounted as not essential or central to the principal role of strategic forces.

The most responsive options for significantly improving the survivability of the ICBM force to a disarming attack are (1) to launch the force on attack assessment, or (2) to rebase the force. While there are other alternatives, they appear less effective or practical. For example, proposals to make the survivors more capable, such as

deploying larger missiles or more RVs per missile, will generally not be recognized as solutions, because the dominant perceived concern is force survivability--not the ability to execute some well-defined task requiring so much throw weight or so many RVs.

Further hardening of silos looks like a losing game in the face of increased missile accuracies. Active ABM defense may be a technically effective way to improve the prelaunch survivability of the ICBM force, but its acceptance is impeded by the restraints of the ABM Treaty and the emotional legacy of the ABM debates.

Launching the ICBM force on attack assessment is probably the simplest and most cost-effective way to frustrate a counterforce attack. But as a *declared* policy, we believe it would be vigorously opposed as both dangerous and unstable (an accident could theoretically precipitate a nuclear war).

Nevertheless, we believe that the *technical capabilities* to launch ICBMs on attack assessment should be developed *for their deterrence value*--so that no adversary would dare assume that the U.S. could not launch the force out from under any attempted disarming attack. They should not be costly. We also see such technical capabilities as providing additional flexibility in crises, where the declaration of an emergency readiness to launch the force on attack assessment could serve as an additional rung in an escalation ladder. But we do not go so far as to urge that the "survivability" of ICBMs be predicated on a policy of launching the force on attack assessment; the assurance of ICBM retaliatory capabilities should not rest upon such an awesome commitment.

The possibilities for improving the prelaunch survivability of ICBMs through rebasing are numerous, but we have seen none that look promising as a solution for the entire force. Our appreciation of the rebasing concepts now being considered for the U.S. ICBM force leads us to believe that if applied to the *entire* force, they would be very costly, of debatable effectiveness, and likely to sacrifice some important attributes (e.g., accuracy and security) of the present force. Of course, the search for rebasing concepts continues, but a good single solution is not yet in sight.

Diversified basing of the ICBM force has been proposed as a means to diversify vulnerabilities, but it will impose most of the same drawbacks as a single rebasing solution: it will be costly, there will be arguments over the relative effectiveness of the several basing schemes, and some of the better characteristics of the present silo basing are likely to be lost. Diversified basing concepts will result in a fragmented ICBM force; and if adopted primarily to improve the overall force survivability, each fraction will inevitably be subject to survivability comparisons with SLBMs. The failure of some portions of the ICBM force to measure up to the perceived survival standards of SLBMs would result in pressures to eliminate marginal or inferior fragments. Hence, piecemeal dismemberment of the ICBM force might be facilitated.

In sum, if the ICBMs have no unique role within the U.S. strategic posture, we do not see a promising future for them. Their evolution would then hinge upon overall force survivability, and we have not been able to identify any good force-wide options for relieving present concerns over ICBM survivability against a preemptive counterforce attack.*

SEVERAL PROMISING FUTURES

If it is accepted that each of the strategic offensive force elements could have a special role or roles within the U.S. strategic posture, then we see several interesting alternatives for the ICBM force. We can think of at least four special roles for ICBMs; perhaps there are more.

Limited Strategic Operations

While providing LSO capabilities cannot be claimed as the exclusive domain of ICBMs, we believe that ICBMs possess and promise more of the desired attributes for LSOs than any other strategic force element. If LSOs are a special role for ICBMs, the principal concerns will be to ensure effective and flexible targeting with minimum collateral damage.

* Even though these concerns seem exaggerated to us. We believe they reflect a preoccupation with a narrow definition of the purpose of strategic forces, with extreme threats, and with simple analytics.

The prospects for controlling unwanted collateral damage while achieving the desired level of target damage are dominated by delivery accuracy. There is little doubt that the accuracy of ballistic missiles can be improved markedly with the technical means available; the questions have to do with whether we *should* improve ICBM accuracies (because of their counterforce implications), by how much, and by what means.

The highest possible weapon delivery precision should be sought for LSO capabilities. For some LSO tasks, zero-CEP via terminal homing is desirable so that the smallest possible yield, or even conventional explosives, can be employed where conditions dictate or permit. While reliance on terminal or external navigation aids for assured retaliatory capabilities might be eschewed, we see no reason why their benefits for lesser contingencies should be forsworn. For LSOs, we believe that ICBMs should not be restricted to all-inertial guidance. This imposes an unnecessary limit on delivery accuracy and, hence, upon the required weapon size and consequent collateral damage.

Options for improving the targeting flexibility of ICBMs for LSOs include additional C³ functions, explicit targeting, variable yield, selectable fuzing, earth-penetrating weapons, etc. All seem worthwhile--at least in small quantities. None seem very costly compared to a new missile or rebasing the ICBM force. Perhaps the greatest impediment to their development is that they are *not* large-scale, force-wide program options.

Large numbers of ICBMs are not required for LSOs, nor are larger missiles with heavier throw weights. In some cases, MIRVs are liabilities rather than assets. In the present U.S. ICBM force, our most accurate missiles are MIRVed, and that could be awkward for some LSOs. A few very accurate single-RV missiles should be available.

Since large numbers of missiles are not required for LSOs, we believe that *elite force* concepts are attractive. Some of the features desired for LSOs could detract from the performance of other strategic tasks if implemented throughout the ICBM force. Moreover, high-confidence hard-target kill capabilities (for LSOs against selected hardened facilities) would not engender as much concern about their

counterforce potential if they were acquired only in limited numbers for an elite force.

An elite ICBM force for LSOs might consist of a squadron (50) or a wing (150) of Minuteman missiles. If the elite force were seen as presenting a preferential target for a Soviet LSO, it might be deployed in Wing VI at Grand Forks, under the Safeguard ABM umbrella. That arrangement might also be seen as advantageous in the rationale for maintaining a single Safeguard site: it could shift the principal threat scenario from an all-out attack to LSOs, a threat that may be technically less demanding (or overwhelming).

If we have any reservation about the potential future of the ICBMs for a special role in providing LSO capabilities within the U.S. strategic posture, it is not with the qualities of ICBMs, but with the concept of LSOs. It remains to be shown whether LSOs are a durable and useful concept contributing to deterrence. If they are, we think ICBMs will evolve as a principal instrument of that concept.

Assured Reserve Capabilities

Another special role is that of providing a reserve of strategic nuclear weapons that can be held inviolable and available for a long time in general nuclear war. While the abilities of U.S. strategic offensive forces to survive in the transattack period have been widely analyzed and discussed, far less attention has been given to the long-term survival of strategic forces in a seriously degraded postattack environment. Because of their relative autonomy during extended patrol operations, nuclear-powered submarines offer attractive survival characteristics (with the possible exception of assured two-way command communications) for periods of several months into a post-attack period. Beyond that time, the breakdown of logistic support would probably limit the availability of SLBMs.

We believe that the U.S. ICBM force has several shortcomings for both immediate and long-term postattack survivability. The immediate survivability problem (past the first day) is tied up with providing electrical power, while the long-term problem in the following weeks is the same as for the SLBMs: logistic support. Both of these

problems could be favorably affected by making the missiles dormant. We believe that dormant operation of a portion of the Minuteman ICBMs would provide a low-cost reserve force with long-term survivability, at least until a significant Soviet counterforce capability emerges.

In the more remote future, if Soviet counterforce capabilities dominate the question of ICBM survival into the postattack period, rebasing of ICBMs for an assured reserve force may be an attractive option. One concept worth exploring is the basing of dormant missiles in secure underground bases.

The needed size of such a reserve is probably no more than a hundred megatons deliverable to several hundred separate aimpoints. The use of MIRVed missiles would reduce the required number of delivery vehicles, but they might be less manageable than a larger number of small missiles with single warheads. In any event, we do not see why reserve force missiles should be burdened with the features and costs for quick reaction, high accuracy, or sophisticated defense penetration.

SLBMs are certainly candidates for an assured reserve force. In a competition, land-based ICBMs may have two advantages: First and perhaps most important, ICBMs in underground bases are likely to be cheaper to store securely out of harm's way than SLBMs continuously at sea. Second, ICBMs can probably be stored (and controlled) considerably longer than the operational life of SLBMs without land-based logistic support.

Counterforce

If a special role for ICBMs is to provide counterforce capabilities, we see an interesting, but very controversial, future. Any investment of counterforce capabilities in the ICBMs will be seen by many as destabilizing, unless they are rebased to better survive any foreseeable Soviet attack. On the other hand, even if the ICBMs were more securely based, some would challenge the need for substantial counterforce capabilities unless the U.S. had aspirations toward a disarming first-strike posture. Either way, any attempt to develop a significant counterforce capability in the U.S. strategic posture is a journey on a bumpy road.

We are aware of some sophisticated arguments for acquiring (or threatening to acquire) counterforce capabilities, but we do not think they would carry the day in the present public debate.

The technical routes to substantial counterforce capabilities include improvements in hard-target kill capabilities through increased accuracies and yields, or through a larger missile with greater throw weight. There is little doubt of the technical feasibility of either approach. If constrained to the present missile, the most expeditious route might be to augment the inertial guidance with radio aids. With a larger missile, larger yields and greater numbers of RVs could compensate for the accuracy limitations of all-inertial guidance.

If ICBMs are rebased to make them relatively immune to attack, then the need for counterforce improvements beyond those needed for LSOs is hard to justify. Moreover, if the requirements for counterforce hard-target kill capabilities do not exceed those needed for LSOs, the qualities of the present fixed silo basing for LSOs seem preferable to those of most rebasing concepts. If counterforce capabilities well beyond those required for LSOs are somehow justified, then for a crisis-stable posture, the adopted basing scheme would have to enforce an unfavorable exchange upon the attacker in terms of counterforce capabilities expended versus those destroyed. Some of the basing options for a new ICBM now being studied by the Air Force meet that criterion, but so do sea basing options.

The possibility of investing any counterforce capabilities in SLBMs rather than in land-based ICBMs cannot be discounted if the development of substantial hard-target kill capabilities is deliberately undertaken by the U.S. With external guidance aids, we believe that the accuracy of SLBMs can be adequate for hard-target kill capabilities within the Trident missile throw weights. Thus, ICBMs might have to compete with SLBMs for any special counterforce role in the U.S. strategic posture.

We are not sanguine about the competitiveness of the available rebasing options for ICBMs. They are not clearly superior to the SLBMs in survivability, even though they are different in their vulnerabilities. The new basing options are likely to be much more costly than

the present silo basing, possibly as costly as submarine basing. However, if the desired or required counterforce capabilities could be efficiently packaged in a relatively small number of missiles--say one or two hundred--then the cost of the rebased force would be bounded in proportion. A numerically small force would likely require a large missile with many accurate MIRVs, and such a missile may not be compatible with mobile basing concepts that have been proposed.

Equivalence

The concept and precepts of strategic equivalence presently reflect some concerns about strategic posture asymmetries and third-party perceptions. These indicate a special role for ICBMs in the U.S. strategic posture because ICBMs are an important part of the Soviet posture.

If the U.S. wants ICBMs in its strategic force posture so as to look equivalent to the Soviets, then retention of the existing force, which is paid for and relatively inexpensive to maintain, is an attractive option. Given only the political imperatives of matching the Soviets in possession of ICBMs and in aggregate numbers of strategic delivery vehicles, there is no more cost-effective choice than the present Minuteman force.

If the measures of equivalence become more sophisticated and include comparisons of ICBM throw weight, numbers of RVs, accuracy, etc., silo basing will continue to offer cost-effective options for maintaining equivalence. Refitting the present silos with a larger missile, while not cheap, will almost certainly be cheaper than most other means for increasing ballistic missile throw weight.

Thus, the present silo-based ICBM force could continue to be an inexpensive way to maintain equivalence with the Soviet strategic posture. Whether the rationale for equivalence is sufficiently developed and accepted to secure a special role for ICBMs is problematical. If the concerns for the survivability and stability of ICBMs lead to rebasing, then we doubt that the ICBM will continue to enjoy its present substantial cost advantage over other strategic offensive forces. In any event, we believe that the political climate will favor equivalence over stability, and that the economic climate will continue to favor the present silo-based ICBMs over missiles otherwise based.

THE OUTLOOK

We believe there are at least four interesting and unique roles for ICBMs within the U.S. strategic force posture. The first and clearest is specialized capabilities for LSOs provided by improvements in a portion of the present ICBM force. The second is a cost-effective strategic reserve force achieved by dormancy of a portion of the present missiles. This should suffice at least until the Soviets possess a significant hard-target kill capability; after that, any strategic reserve force will require more secure basing than will be afforded by our present ICBM silos.

The third role for ICBMs is that of a limited force with durable high-quality counterforce capability. This role is clouded by lasting concerns about stability and disarming first-strike postures, and by potential competition from SLBMs. Effectiveness in this role does not depend on hard-target kill capability; rather, it depends on a cost-effective and competitive basing scheme that is relatively immune to attack. We have not recognized such a scheme yet.

The fourth role is that of providing ICBM equivalence at low cost. The key here is to retain as much as possible of the present silo basing; other basing schemes surrender the substantial cost advantages of ICBMs over SLBMs and bombers.

We believe that these special roles for ICBMs pose interesting and attractive future alternatives for the U.S. ICBM force, especially when contrasted with the future we see if the ICBMs are denied any special role within the U.S. strategic posture. We have seen no new basing option for ICBMs that would cure their shortcomings without also sacrificing some of their best characteristics. While the search for basing options should proceed, of course, we are persuaded that the future of the U.S. ICBM force should not be predicated--inadvertently or intentionally--on finding a *single* new basing scheme. It might just cost us the entire force, and we think the U.S. strategic posture would be much the worse for the loss.