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ORBITING SENTINELS FOR SECURITY

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NOTE: THE OPINIONS CONTAINED IN THIS ARTICLE REPRESENT THE VIEWS OF THE AUTHOR, AND DO NOT NESESSARILY REPRESENT THE POSITION OF THE DEPARTMENT OF DEFENSE OR THE U.S. GOVERNMENT.

INTRODUCTION

For the past forty years, the threat of retaliation has been the foundation of our national security strategy. This threat has been the basis of the deterrent strategy which has helped maintain a relatively peaceful relationship between the world's major powers. However, this strategy has also led to an expensive and possibly dangerous need to maintain large numbers of nuclear and conventional weapons around the world.

These difficulties with retaliatory deterrence are the main reason for many of the alternative strategies which are being considered. One alternative is to move beyond threat in structuring our national security posture. New technical and political opportunities may now make promoting mutual security rather than mutual threat a realistic means of protecting our interests.

The advent and political acceptance of on-site- and space-based sensors and observers to verify compliance with arms control agreements has opened a new era of global stability and security. At the same time as nuclear weapons and ballistic missiles were being perfected, space-based observation systems were also coming to maturity. On the other hand, the provision for on-site observers to monitor treaty compliance on a large scale is a relatively recent phenomenon in the U.S.-Soviet relationship.

First used to observe the earth's natural resources and to monitor arms control agreements, space-based sensors have injected new stability into international relationships. Orbiting sensors which can see deeply and constantly into the territory of all nations can provide early warning of impending hostilities. By being able to detect threats at their source, in the homeland of the potential aggressor, space sensors are helping make large-scale surprise attack an artifact of the past. With improved information regarding a potential adversary's military activities, military responses can be planned and executed with greater precision, avoiding much of the overreaction which led to inadvertant escalation in past conflicts. Finally, the existence of these sensor capabilities has acted to deter conflict: a potential aggressor knows he is being watched.

The fact that space sensors can detect missile launches as soon as they occur has formed the backbone of our current nuclear

deterrent strategy since the 1960's. It is precisely because space sensors can provide early warning of missile attack that the U.S. and the Soviet Union can today credibly threaten retaliation against any nuclear attacker. Without this early warning, the threat of retaliation would be hollow. Adequate warning, based on information from space, is the key to our current strategy of nuclear deterrence.

At the same time as orbiting observation systems are maturing, the growing political acceptability of on-site observers on the ground also offers a powerful new tool for maintaining confidence that threats are understood. When used in combination with space-based observation systems, they provide a unique abilty to detect and identify emerging threats, and thereby discourage the development of such threats in the first place.

Orbiting sensors can survey wide areas repeatedly, looking for changes or other indicators that suspicious activity may be occuring. They cannot, however, look into buildings or produce detailed inspections of suspected weapon developments. These latter steps can be performed by on-site observers, who themselves must be cued by sensors which can survey broad areas repeatedly, from orbit. On-site observers must use satellite communication links to quickly and securely report their findings to their home countries.

These new information gathering and evaluation capabilities offer to revolutionize the strategies by which nations maintain their security. In the process, they may offer the first really new concept for global stability in forty years.

BACKGROUND

Since the end of World War II, the United States and the Soviet Union have maintained weapons of mass destruction whose primary purpose is mutual threat. The unprecedented investment of national wealth in systems for strategic warfare has produced a massive stockpile of weapons and destructive capability never before imagined. These weapons have successfully maintained a relatively stable global environment for the past four decades, based on their ability to deter conflict by threatening unacceptable retaliation.

Unfortunately, this is a very expensive strategy, and one that many feel we cannot afford. A credible deterrent requires the ability to conduct warfare at whatever level is deemed appropriate to the situation; thus the concept of "flexible response." To conduct extended warfare as one escalates through increasing levels of nuclear employment requires command, control, and communications systems and the weapons they support to be designed for unprecedented punishment. The morale and obedience of the troops must be unquestionable if they are to provide a credible nuclear warfighting force. Finally, there must be some sort of economic infrastructure to support the country during such

an extended conflict.

Our concept of strategic warfare also forms the backbone of "extended deterrence", a concept by which our global interests, including the security of our allies, is "guaranteed" by the threat that we can and will attack the Soviet Union, if adequately provoked. Most specifically, this concept of extended deterrence has come to underlie our commitment to the defense of our European allies in the North Atlantic Treaty Organization (NATO).

Extended deterrence promises to protect our European allies by offering the possibility of nuclear response to an attack on our allies. In the first order, nuclear weapons could be used to blunt a conventional attack from the Warsaw Pact, if our conventional forces could not do the job. The very possibility of such a response has helped maintain deterrence in Europe. Of course, this defense itself could bring unparalleled destruction to the continent, and to the homelands of our allies in particular. Thus, the strategy of nuclear defense of Europe appears to contain the latent seeds of its own demise.

The next step in this strategy would be the launching of nuclear weapons from the United States against the Soviet Union itself, in an attempt to dissuade them from continued aggression in Europe. That such action could lead directly to global nuclear holocaust has been long and widely recognized.

It has even been postulated by various scientists that the detonation of even a "few" nuclear weapons (on the order of a hundred) could raise enough soot, ash and smoke into the atmosphere to block the sun and dramatically lower the world's temperature. Even though this theory has not been fully substantiated, this possibility of "nuclear winter" adds to the obvious question: what clash of interests between the U.S. and the Soviet Union could justify the destruction which would be caused by such a conflict?

It is extremely hard to justify warfare which leads to such outcomes, and both the U.S. and the U.S.S.R. know it. Nuclear warfare cannot be won and should not be fought, in the words of former President Reagan. And the concept of extended deterrence, whose credibility rests in turn on the credibility of a global nuclear conflict, is being challenged. As a minimum, we would prefer a situation in which our survival was under our own control. For these reasons, strategies which seem to have worked for four decades are being reexamined.

Of course, many believe that we could have no quarrel with the Soviets that would conceivably justify using nuclear weapons to destroy each other's homeland. It is difficult to conceive of a situation in which rational men and women would decide to unleash the total destructive capacity now residing in our nuclear arsenals. For very good reasons, neither side is likely to intentionally initiate a nuclear conflict with the other.

The problem is, of course, that men and women are not always rational, nor are they always in control of events. That is one of the sobering lessons of history. Therefore, the very existence of these tens of thousands of nuclear weapons could be one of the greatest real threats to the security of the world today. Accidents, miscalculations and other forms of unintended catastrophe can happen.

These are only the most obvious issues which must be solved if a credible deterrent is to rest on a strategy of flexible response and protracted conflict. It is not surprising, then, that this strategy has been met with a large degree of skepticism, at both the professional and political levels, not to mention growing concern about its validity by the public.

As a possible alternative security arrangement, it is not hard to envision a set of international relationships in which all major powers would at all times feel that their basic security was protected. In the case of the U.S. and the Soviet Union, this would mean that the primary reason for maintaining nuclear forces, to deter attack on each other, would no longer exist. In such a defense-dominant relationship, the threat to the homeland of each country would be minimized.

If our allies were also confident that they, too, were much less susceptable to rapid, devastating attack, the need to maintain a policy of extended deterrence would be significantly reduced.

A framework for mutual security, would rely more heavily on defensive strategies which seek to protect rather than to threaten. Therefore, such strategies are less likely to provoke an "arms race" and lead to an endless quest to keep others under threat.

Of course, even in a power balance more heavily characterized by defenses, tactical offensive capabilities will still be needed, as long as warfare is a possibility. The offense is a key element of any military action, and such capabilities should not be denied. However, the move to defensive strategies could reduce the need for massive, swift-acting offensive forces, and, in the process, could reduce the possibility of conflict.

At the same time, the move away from a large retaliatory strategic force structure could allow our offensive forces to be better focused toward tactical war-fighting needs, aimed at the many and varied kinds of threats which will likely face the military in the coming years.

The challenge, then, is to find a proper context for building a security relationship which avoids the undesirable features of the deterrent posture analyzed above. The "win-win" approach of mutual security seems to offer one such possibility.

Once we have accepted the premise that we do not have to

threaten a potential adversary to properly manage our side of the relationship, then we can begin to consider ways to strengthen our security without provoking others in the process.

This, then, is an alternative strategy to mutual deterrence based on retaliation. It is a strategy which could lead to a real reduction of tensions and to greater security for the world's major powers, and, in turn, for the entire planet. It represents a commitment to mutual security from imminent massive destruction for all the world's people. In this context, a move toward a more defense-oriented strategy makes sense.

INFORMATION FOR STABLE SECURITY

The objective of mutual security would be to create and maintain a situation in which no world power possesses enough destructive power to inflict unacceptable damage on another. To arrive at such an arrangement would require all major powers to recognize that mutual security is in fact in their common interest.

The critical and often under-appreciated link in this transition, however, is the need for information. To be mutually secure, all nations must have confidence that their potential adversary or adversaries do not possess the ability to overwhelm their own organic defenses. To achieve this confidence, it is essential that each country use available information gathering capabilities to ensure itself that its potential adversary did not, in fact, retain enough weapons to pose an unacceptable threat. Verifiable confidence, not threat, then, would become the basis for security.

In theater warfare such as Europe, space sensors will also be the key to maintaining defenses which are not provocative. What we call a European "theater" war is, of course, homeland or strategic conflict to the Europeans. The same logic applies here as it does to U.S./Soviet homeland warfare, except that the distances and, therefore, attack times are much shorter. The goal is to establish defenses which do not threaten the homeland of either side.

Clearly, in locations such as Western Europe, the possibility exists to replace offensive weapons with more defensively oriented ones. Although there is probably no such thing as a purely "offensive" or "defensive" weapon, for the purposes of this discussion offensive weapons are such systems as tanks, missiles, and attack aircraft. Defensive weapons include anti-tank weapons, mines and passive devices such as barriers. Use of more defensive oriented weapons in Europe is a strategic concept which has been thoroughly examined elsewhere.

Of course, since "offensive" weapons would be needed to respond in case of attack, they must be available. The concern for security arises when they are positioned so as to pose an immediate threat to other nations, and must therefore be countered by opposing deployments of the other side, creating the kind of

potential instabilty we are trying to avoid. Thus, a parameter of interest in theater force deployments is not only the kind of weapons used, but also their location.

Remembering that the objective of mutual security is to reduce or eliminate the immediate threat to each country's homeland, and thereby promote its sense of security, it appears desirable that weapons capable of such an attack be removed from the immediate vicinity of potential hostilities, so as not to pose an immediate threat.

The answer to the long standing dilemma of how to provide defenses which can respond quickly to a developing threat but do not themselves pose an immediate threat to the other side is early warning. This warning time is the primary requirement for mobilizing or moving defenses into position, assuming that the threatening forces were deployed well behind the threatened region prior to their call-up.

Arms control regimes which move threatening forces away from areas of immediate contention would therefore promote stability in such "theaters". Basing force structures on warning-oriented strategies, where warning can be certain and accurate, would thus help eliminate tensions in some of the most contested areas of the planet.

Of course, weapons alone, offensive or defensive, cannot guarantee peace. Peace and stability can only be maintained by methods which address the underlying issues which precipitate conflict. Unless the diplomatic, humanitarian, political, social and economic instruments of statehood are brought to bear on their root causes, strife and conflict are inevitable. The best the military can hope for is to create a situation which maintains a stable peace long enough for other, non-violent methods of resolving conflicts to be effective.

What we are finding is that the ability to provide such information is developing rapidly, significantly improving our opportunity to develop new security strategies. The options described here would not have been possible only a few years ago; the information gathering, dissemination and processing capabilities these options require were not yet available. Now they are, and the new strategic concepts they enable should be identified and assessed.

INFORMATION SOURCES

For nations to rely on information for warning of emerging threats, there must be a high degree of confidence that the needed information will be collected and interpreted correctly in a timely manner. Many different types of sensors will be needed to minimize the ambiguity of such data. The fact is that the world's technical ability to deploy and exploit a wide variety of space information gathering capabilities is undergoing revolutionary change.

Whereas, in the past, only a few countries had the ability to conduct earth remote sensing from space, this ability is now becoming commonplace. Once the exclusive province of the U.S. and the U.S.S.R., such satellites are now flown by Japan, Europe, Canada, India and China, with other entrants in the wings. Over 20 countries or international organizations plan to fly civil or commercial remote sensing satellites in the 1990's.

Not only is the number of nations with satellite monitoring capabilities increasing rapidly, but the technology to conduct such activities is being revolutionized. Newer, more capable, and more efficient devices to conduct remote sensing are being developed around the world.

In addition, over the past few years, the capability to sustain human observers in orbit has dramatically improved. Based on the early U.S. and Soviet experimental flights, our civilization is experiencing a dramatic step in the evolution of humankind, as men and women learn to live in space. Technologies represented by the U.S. Skylab and Space Shuttle and the Soviet Buran shuttle and Salyut and Mir space stations will continue to evolve as the permanent presence of humans in earth orbit becomes a reality. Future capabilities, such as the international space station program led by the U.S. and evolutionary developments of the Soviet systems, will enable human observers to remain productive in orbit for increasingly longer periods. With their ability to observe large areas quickly, peer through holes between clouds, and draw on fine visual acuity, observers in orbit may be uniquely able to detect cues which can lead to more detailed investigation by remote-sensing satellites or observers on the ground.

Newly emerging potentials offer the possibility of being able to rapidly and economically observe areas anywhere on earth from space, with only minutes notice. Such short- or no-notice inspection capability could go a long way toward providing necessary confidence that no new threats were developing.

The great potential for information collection offered by such orbiting sensors is one of the main reasons they are being promoted as useful tools for understanding stresses to the global environment and managing global resources. Satellite sensors may also be a powerful tool for finding and interdicting drug traffic into the United States. Sensor systems used to maintain military stability would thus have significant ancillary peacetime benefit.

It is this rapid growth in the ability of the people of this planet to observe themselves from a new perspective which gives rise to the need to reexamine our concepts of how we organize ourselves to face our common challenges. For it is not military and traditional security considerations alone which will be influenced by these new capabilities. The implications, the effects, will be far-reaching indeed.

CONCLUSION

The advent of space-based information collection and dissemination systems has opened new possibilities for restructuring international relations. Just as the creation of the nuclear-tipped ballistic missile and the long range bomber ushered in the era of defense by threat of nuclear retaliation, so has the development of orbiting surveillance and communication systems enhanced the possibility of security based on confidence. These are our new sentinels.

We seem to be moving from a relatively brief period in history in which satellite systems have been used to verify constraints on or reduction of strategic arms to a period in which such weapons may well be inappropriate for maintaining security -- a shift enabled by the capabilities of those same space-based observation devices. Conventional threats in Europe and elsewhere would be radically reduced as nations moved away from the threat of rapid attack and ground- and space-based observers were deployed to provide constant confirmation of mutual security.

Is cooperation for mutual security possible? We know, for example, that the Soviets have often offered to reduce or eliminate weapons of various sorts, including missiles, space weapons, and ground troops. Our main concern is that we cannot be sure that they are sincere, or that such actions could be verified or enforced. We worry about a world in which they do not keep their agreements. These are valid concerns, of course.

Clearly, the rewards of an effective agreement would be great. Such an ideal may seem a simplistic dream, but it is not unrealistic to expect the nations of the world to act in ways which further their self interest. In many ways, the proposals presented here meet that criterion.

Security systems which promote communication, which add time and information to strengthen diplomacy and other conflict resolution approaches, and which in themselves create national wealth are certainly systems worthy of consideration. Systems and technologies which are conducive to solving political problems by political means, and which encourage cooperation and dialog, rather than systems which threaten, may indeed be most conducive to long term security, stability and prosperity. These are the characteristics of the sentinels in space.