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The Revolution in Military Affairs and the Future of Arms Control and Verification

Joel Sokolsky

Prepared for the

International Security Research and Outreach Programme
International Security Bureau

February 2001



Department of Foreign Affairs
and International Trade

Ministère des Affaires étrangères
et du Commerce international

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PREFACE

The views expressed in this paper are those of the author, and do not necessarily reflect the views or positions of the Department of Foreign Affairs and International Trade or of the Government of Canada.

The International Security Research and Outreach Programme commissioned a study to assess the impact of the RMA upon arms control

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EXECUTIVE SUMMARY

The Revolution in Military Affairs (RMA) presents two related problems for arms control. First, is the susceptibility of the RMA itself to credible and verifiable arms control measures, second the possible adverse impact of the RMA on existing efforts to control Weapons of Mass Destruction (WMD). If the RMA has fostered a measure of obscurity and uncertainty, rather than clarity, about the future of warfare, it has done no less when it comes to arms control.

The RMA has generated considerable, and inconclusive debate as to whether it is a "true" revolution in the nature of warfare or only part of a continuing "evolution" in weapons technologies, military organization and doctrine. It is closely associated with the post-Cold War national security policy of the United States which seeks to maintain America's dominant position and freedom of action at acceptable costs through the application of advanced technology to warfare.

The lessons of arms control during the Cold War suggest that arriving at a regime which could control elements of the RMA will be difficult given the inherent paradoxes of the arms control process itself and the particular nature of the RMA. The fact that the weapons systems which comprise the RMA are considered "conventional" and the large role played by easily obtainable civilian technologies in these systems indicate that there is likely to be a "proliferation" of the RMA outside the West. Another factor promoting the spread of the RMA is the desire of countries to provide counters to the technological superiority of the United States and its allies.

While there is much that is observable in the spread of the RMA, especially in terms of military organization and doctrine, existing arms control methodologies and technologies do not lend themselves to the establishment of a credible verifiable regime which could curtail the spread of the RMA. Given the nature of the weapons technologies, such a regime would require a level of intrusive, on-site verification measures which few countries would accept and which would be extremely difficult to sustain. Moreover, any international effort to control the spread of the RMA, which is led by the United States and its allies, will be seen as an unequal application of arms control norms in a manner similar to the perception of the Nuclear Non-Proliferation Treaty (NPT).

One of the major concerns with the RMA is the possibility of an "asymmetrical" response using WMDs by states or group against which RMA technologies are to be used. This in turn has contributed to efforts by the United States and its allies to deal with the WMD threat through multilateral arms control measures, such as the NPT and efforts to control chemical and biological weapons. The West has also adopted unilateral counter-proliferation efforts. Amongst the latter is the retention by the United States and NATO of the threat of nuclear response in the event that WMDs are used against them in response to their use of RMA technologies in future military action. Thus the West now has a new reason not to fully abandon nuclear deterrence, fear of asymmetrical responses to the RMA.

Examining scenarios in which the United States threatens or applies RMA against states with varying degrees of conventional, RMA and WMD capabilities, suggests that the effectiveness of the

RMA will vary according to the magnitude of such capabilities, the nature of any conflict and the political situation. States with large conventional forces and even an limited WMD capability can raise the cost of intervention to the United States or even deter it. But there is the threshold issue that complicates any predictions about how states will respond to RMA use and potential WMD counter-responses. Will small and weak states risk retaliation by nuclear weapons if they employ WMDs against American forces or the United States itself? Will Washington cross the line if its troops are attacked by chemical weapons? Just as the various scenarios point to no conclusive answer on the action-reaction dynamic of RMA use, so too are the arms control possibilities varied. Some states may be amenable to arms control and abandon a WMD capability to respond to the RMA, while others, depending on their security situation and the character of their governments may wish to retain it and reject WMD arms control measures.

However, concern about WMD is very much on the international agenda and much has been done to establish new norms. In some areas of arms control, such as nuclear weapons, progress has been made. Given the other factors that affect the international security environment, and the very uncertainties associated with the RMA, there is reason to conclude that arms control will survive the RMA. Thus the future international security environment is likely to be one where *both* the RMA and arms control will present competing, but not always mutually exclusive, claims for the enhancement of international strategic and political stability.

RÉSUMÉ

La Révolution dans les affaires militaires (RAM) présente deux problèmes connexes en ce qui concerne le contrôle des armements. Le premier est la susceptibilité de la RAM elle-même à des mesures crédibles et vérifiables de contrôle des armements, et le second, l'effet négatif possible de la RAM sur les efforts accomplis actuellement pour contrôler les armes de destruction massive (ADM). Si la RAM est source d'obscurité et d'incertitude plutôt que de clarté au sujet de l'avenir de la guerre, il en va de même à propos du contrôle des armements.

La RAM a suscité un débat considérable et peu concluant sur la question de savoir s'il s'agit d'une « vraie » révolution dans la nature de la guerre, ou seulement d'un stade d'une « évolution » continue de la technologie des armes ainsi que de l'organisation et de la doctrine militaires. Elle est intimement liée à la politique de sécurité nationale pratiquée en cette époque d'après-guerre froide par les États-Unis, qui cherchent à maintenir leur position dominante et leur liberté d'action à un coût acceptable en appliquant la technologie de pointe à la guerre.

Les leçons tirées du contrôle des armements durant la guerre froide donnent à penser qu'il sera difficile d'arriver à un régime capable de contrôler les éléments de la RAM, en raison des paradoxes inhérents au processus même de contrôle des armements et en raison de la nature particulière de la RAM. Le fait que les systèmes d'armes qui composent la RAM sont considérés comme « classiques », et le grand rôle que jouent dans ces systèmes des technologies civiles faciles à obtenir, laissent prévoir une « prolifération » de la RAM ailleurs qu'en Occident. Un autre facteur qui favorise la propagation de la RAM est le désir de certains pays de contrer la supériorité technologique des États-Unis et de leurs alliés.

Bien que la propagation de la RAM soit en grande partie observable, particulièrement en ce qui concerne l'organisation et la doctrine militaires, les méthodes et les techniques actuelles de contrôle des armements ne se prêtent pas à l'établissement d'un régime de vérification crédible, de nature à endiguer cette propagation. Étant donné la nature des techniques d'armes, un tel régime nécessiterait des mesures de vérification sur place si envahissantes que peu de pays les accepteraient et qu'elles seraient extrêmement difficiles à maintenir. En outre, toute campagne internationale menée par les États-Unis et leurs alliés contre la propagation de la RAM serait perçue comme une application inégale des normes du contrôle des armements, comme c'est le cas du Traité de non-prolifération nucléaire (TNP).

Une des grandes préoccupations que suscite la RAM est la possibilité d'une réaction « asymétrique », comportant le recours aux ADM, de la part d'États ou de groupes d'États contre lesquels les techniques de la RAM doivent être utilisées. Cette crainte encourage les États-Unis et leurs alliés à tenter d'obvier à la menace des ADM par des mesures multilatérales de contrôle des armements, telles que le TNP et les efforts visant à contrôler les armes chimiques et biologiques. L'Occident a aussi adopté des mesures unilatérales de lutte contre la prolifération; mentionnons à ce propos le maintien de la menace de recours à l'arme nucléaire par les États-Unis et l'OTAN, au cas où des ADM seraient employées contre eux en réponse à leur usage des technologies de RAM

dans une éventuelle action militaire. L'Occident a donc une nouvelle raison de ne pas renoncer entièrement à la dissuasion nucléaire : la crainte de réactions asymétriques à la RAM.

L'examen des scénarios où les États-Unis appliquent ou menacent d'appliquer la RAM contre des États dotés de divers niveaux d'armement classique, de RAM et d'ADM suggère que l'efficacité de la RAM dépendra de ces niveaux d'armement, de la nature d'un éventuel conflit et de la situation politique. Les États dotés de forces classiques considérables et même d'un niveau limité d'ADM pourraient faire augmenter le prix d'une intervention des États-Unis, ou même dissuader ceux-ci d'intervenir. Mais il y a aussi la question du seuil, qui complique toute prédiction concernant la manière dont les États réagiront à l'usage de la RAM et les contre-réactions éventuelles aux ADM. Les petits États faibles risqueront-ils de s'exposer à des mesures de rétorsion par l'arme nucléaire s'ils recourent à des ADM contre des forces américaines ou contre les États-Unis eux-mêmes? Washington fera-t-il le geste décisif si ses troupes sont attaquées au moyen d'armes chimiques? Tout comme les divers scénarios n'apportent pas de réponses concluantes quant à la dynamique des actions et réactions en cas de recours à la RAM, les possibilités varient en ce qui a trait au contrôle des armements. Certains États pourront être ouverts au contrôle des armements et renoncer à leurs ADM comme moyen de réagir à la RAM, alors que d'autres, selon leur situation de sécurité et le caractère de leur gouvernement, voudront peut-être les conserver et rejeter les mesures de contrôle des ADM.

Cependant, les préoccupations concernant les ADM sont bel et bien au programme des affaires internationales et beaucoup d'efforts ont été déployés pour établir de nouvelles normes. Dans certains secteurs du contrôle des armements, notamment en ce qui concerne les armes nucléaires, des progrès ont été accomplis. Vu les autres facteurs qui influent sur le climat de la sécurité internationale, et vu les incertitudes qui règnent à propos de la RAM, on a des raisons de conclure que le contrôle des armements survivra à la RAM. Le futur climat de la sécurité internationale sera donc une situation où la RAM et le contrôle des armements présenteront l'un et l'autre des avantages contradictoires, mais pas toujours mutuellement exclusifs, pour le développement de la stabilité stratégique et politique internationale.

THE REVOLUTION IN MILITARY AFFAIRS AND THE FUTURE OF ARMS CONTROL AND VERIFICATION

INTRODUCTION

There has been much debate on whether or not the technologies, weapons and emerging doctrines associated with the Revolution in Military Affairs (RMA) constitute a true “revolution” in the nature of warfare. There has been less consideration of whether the RMA will engender a corresponding “revolution” in arms control. In part this is because there is the view that the weapons systems, doctrines and military organizational changes associated with the RMA are not trends whose control is possible, necessary, or even desirable. In other words, while there is general agreement that nuclear, biological, and chemical weapons are fit subjects for arms control, even by some of those states which possess them, the systems associated with the RMA has thus far garnered no such consensus.

The issue of controlling the RMA is linked with other aspects of arms control, for it has in a sense complicated or intruded upon older weapons developments and efforts to control them. Thus no sooner did the end of the Cold War make possible the conclusion of the Strategic Arms Reduction Treaties (START I and II), than the RMA introduced a new class of weapons and warfare which in one sense has made strategic nuclear arms control less relevant than it had been. This is because nuclear weapons are no longer the dominant measure of military power for the United States and Russia. In another sense, however, the advent of the American RMA has heightened concern about the control of nuclear and other weapons of mass destruction (WMD). Efforts at arms control such as the Non-Proliferation Treaty (NPT), attempts to curb missile technology as well as chemical and biological weapons may well be more difficult as countries that lack the ability to respond to RMA systems in kind, will seek out alternative means of deterrence and defence. This in turn leads to a further complicating factor. Despite increased importance placed by the United States on the RMA, neither it nor its allies, seem prepared to entirely abandon nuclear deterrence in face of the spread of WMD capabilities.

The study below examines the RMA from an arms control standpoint. It discusses the question of whether the RMA itself can be subjected to arms control measures and what the impact of the RMA is on efforts to control WMDs. The paper does not take a position for or against the RMA or arms control. Rather, its objective is to provide an analysis of the various complicating factors that have arisen with regard to arms control as a result of the advent of the RMA. As with the previous Cold War era of arms control, wherein many of the paradoxes and uncertainties of nuclear weapons were never conclusively resolved, and where substantial disagreement existed over these issues, the arms control impact of the RMA points to a wide range of often self-contradictory scenarios and has likewise fostered differing views about the best policy choices.

POLITICS, TECHNOLOGY, DOCTRINE AND ORGANIZATION: THE DEBATE OVER THE RMA AND THE FUTURE OF WARFARE

Whatever its real-life impact, the RMA has generated considerable upheaval in the strategic studies scholarly community. But it is a debate which to many goes beyond academic interest since it is expected that how it is settled will have profound impact upon how nations develop and posture their forces for war. This is especially the case in the United States.

For the RMA, especially its strongest proponents, technology and its application to warfare is the dominant theme. Most share Martin van Creveld's opening premise in his book, *Technology and War*, '...war is completely permeated by technology and governed by it.' Warfare, particularly from the introduction of gunpowder in the 12th century, "has been captivated by technology." "Some historians could make a strong case that since the introduction of the wheeled chariot mankind has been obsessed with the search for that particular technology that would guarantee success on the battlefield."¹

War, however, is not, despite what so-called realists contend, entirely devoid of moral content. As Michael Walzer observed in his *Just and Unjust Wars*, "for as long as men and women have talked about war, they have talked about it in terms of right and wrong...aggression, self-defense, appeasement, cruelty, ruthlessness, atrocity, massacre-all these words are judgements, and judging is as common a human activity as...fighting."² Over the centuries, norms about what should or should not be done in war have evolved, even as they have been violated, most spectacularly in the last century. One of the most important of these norms is the requirement to avoid unnecessary civilian casualties. Indeed, as noted below, one of the claims of the RMA is that in bringing ever advancing technology to bear on war, it can reduce "collateral damage." In this sense, the debate over the RMA is consistent with all past debates over the nature of warfare combining both moral and technological arguments. But, as in the past, the technological dimension is the overriding consideration.

Andrew Krepinevich's definition is often cited as that most closest to the mark. An RMA takes place when,

"...the application of new technologies into a significant number of military systems combine[d] with innovative operational concepts and organizational adaptation in a way that fundamentally alters the character and conduct of conflict. It does so by producing a dramatic increase- often an order of magnitude or greater-in the combat potential and

¹ Col. Howard Marsh, "Emerging Technology and Military Affairs," in Thierry Gongora and Harald Von Roekhoff, *Toward A Revolution in Military Affairs? Defense and Security at the Dawn of the Twenty-First Century* (Westport: Greenwood Press, 2000), pp. 61-62.

² Michael Walzer, *Just and Unjust Wars: A Moral Argument with Historical Illustrations* (New York: Basic Books, 1977), p.3.

military effectiveness of armed forces.”³

A central tenet of the RMA, and the reason why it has fostered such intense debate, are the claims that only those states who will be able to master the changes will be confident of victory in future wars.

“The traditional, fundamental principles of war will still apply. Yet major departures are coming for two reasons. Many military forces are going to become more powerful and capable of high-technology warfare at the high end of the conflict spectrum. And a growing number of conflicts likely will be fought at the low end of the spectrum. Sophisticated technology may not be dominant in many of them. Both trends, and their interaction, will change warfare. ...This dynamic is hardly surprising. Warfare has continually evolved over the past two centuries. Military establishments that best anticipated change have generally been the most successful in war. By contrast, those that failed to foresee the future, and remained complacent and static, have often been surprised and defeated.”⁴

Yet behind these general claims for the RMA is a more specific national claim, or rather expectation, that it will be the United States, the ‘founding father’ of the RMA which will reap the greatest benefits. While the RMA offers opportunities to other countries which will be able to afford the acquisition of “expensive modern weaponry and the skills to use it properly[...]only the United States, with its vast accumulation of military capital, better than four times the defense budget of the next leading power, and an unsurpassed ability to integrate large, complicated technological systems, can fully exploit this revolution.”⁵ The RMA offers America “the prospect of military power beyond that of any other country on the planet, now and well into the next century.” This is why American theorists have embraced the RMA for it appears to afford the United States the opportunity to perpetuate its power.⁶

There is indeed about the RMA an American “boosterism,” a profound sense of national uniqueness in the technology and doctrine of war. “The next century is confidently expected to be an American one where everyone follows our example: everyone must follow in our wake or fall apart. And that fact gives us a lasting information edge.” By using the technologies, including information warfare, America will be able to confound and quickly defeat its enemies, striking at whole countries and destroying their will along with their forces and infrastructure, while they will

³ Andrew F. Krepinevich, “Cavalry to Computer: The Pattern of Military Revolutions,” *The National Interest* 37 (Fall 1994), p. 30.

⁴ Richard L. Kluger, “Conventional Operations and Warfare: A New Era Ahead?” *Strategic Assessment 1999: Priorities for a Turbulent World*, (Washington, D.C.: Institute for National Security Studies, National Defense University), p. 261.

⁵ Eliot Cohen, “A Revolution in Warfare,” *Foreign Affairs* vol 75, no 2, (March/April 1996), pp. 50-1.

⁶ *Ibid*, p. 54.

be unable to strike back. These emblems of United States technological superiority," observes Blank, "taken together and multiplied in effectiveness" are alleged to "confer not just operational superiority, but a lasting American superiority and hegemony."⁷

Writing in 1992, Van Creveld argued that a major break with the past was coming. He argued that as military technology, and the organizations needed to fully implement it advanced, the forces of the major powers came to resemble each other and "to see each other as their most dangerous opponents and, consequently, they acquired more and more powerful technology to smash each other." In the twentieth century, fewer and fewer countries were able to compete. "By 1914, only a few countries could still produce all their weapons, field first rate armed forces and incidently, divide the globe among themselves." With the advent of the Cold War, continued enhancement of conventional weapons and, above all, atomic power, this number was further reduced.⁸ With the end of the Cold War, and the cost of major weapons systems only one power capable of fielding the full array of modern forces was left, the United States.

But Van Creveld also contended that since the development of nuclear weapons, and despite improvements in conventional capabilities brought about by improvements in surveillance and accuracy, the era of large scale interstate conventional warfare was nearing its end. Both superpowers tried to develop nuclear and conventional arms in an effort to "decouple" them from full "scale 'strategic war," but gave up, "whereupon one Superpower disintegrated and the other started bringing its forces home. With this example to follow, as of 1992, other countries seem to be following the same road, in the Middle East and South Asia, "proliferating nuclear technology was well on its way to putting an end to large scale, conventional conflict".⁹

Van Creveld stressed that most of the conflicts since 1945 have been low intensity conflicts and most of them were waged "by or against political entities that were not states with the aid of armed forces not amounting to regular armies." He noted that none of the twenty conflicts then going on was being waged by "state-owned, regular, armies with the aid of heavy modern weapons or at least not on both sides". Because of this, military technology, "appears ready to shift gears. Technology in short will focus less on defending against an external threat by regular forces and more on providing security against an internal one. Its enemies will be guerillas and terrorist who in turn will often be indistinguishable from ordinary criminals; and indeed the shift is taking place

⁷ Stephen Blank, "How We Will Lose the Next War with Russia: A Critique of U.S. Military Strategy," *Defence Analysis* (15) (1998), pp. 120-1.

⁸ Martin Van Creveld, "High Technology and the Transformation of War-Part I," *Royal United Services Institute Journal* (137) (October 1992), p. 78.

⁹ *Ibid.* pp. 80-1.

right now.”¹⁰

Predictions of sweeping change, both in technology and especially in the nature of warfare, do not appear to have been entirely borne out as the century ended. The technology of war has evolved, but conventional forces, --air forces, navies and especially armies-- have been used repeatedly, although not in major interstate warfare. More importantly, while the United States did bring its forces home from many foreign bases, they have not stayed home. Indeed, as stressed in this study, one of the key elements driving the RMA is that the United States seeks to continue to project its power abroad. In this regard, Van Creveld's other suggestion that the proliferation of nuclear technology will convince non-Western states of the disutility of large-scale conventional war, does not appear to be the main concern, rather it is that nuclear weapons and other WMDs will be used as counters to the RMA.

Although technological developments are key to predictions made by the RMA, a 1999 study by the RAND Corporation for the United States Defense Advanced Research Projects Agency (DARPA) suggests that the role of technological change needs to be placed in perspective. This is because, fundamentally, an RMA “involves a paradigm shift in the nature and conduct of military operations which either *renders obsolete or irrelevant* one or more core competencies of a dominant player or creates one or more new core competencies, in some new dimension of warfare, or both.”¹¹ For example, it could be argued that the introduction of the aircraft carrier constituted an RMA as far as naval power was concerned because it undermined the core competency of the dominant naval powers which had been large battleships. The advent of the Intercontinental Ballistic Missile (ICBM) shifted the paradigm by creating a dimension of warfare, intercontinental strategic warfare and creating a new competency, the long-range accurate delivery of nuclear weapons. The introduction of the machine gun shifted the paradigm by creating a “new tactical level model for land warfare,” and “rendered obsolete” the competency in being able to “maneuver massed forces in the open.” In some future conflict the employment of “cyberspace-based technologies” by one side against another sufficient to alter the course of the conflict, would be an RMA “since it would create a new core competency (information warfare) in a new dimension of warfare (cyberspace).”¹² This is an important point, since if the RMA is to fundamentally change the nature of warfare, then it must in some sense provide one state or group of states advantages which negate previous advantages, even those held by the state introducing the new weapon.

¹⁰ Ibid, “High Technology and the Transformation of War-Part II,” *Royal United Services Institute Journal* (137) (December 1992). p. 62.

¹¹ Richard O. Hundley, *Past Revolutions, Future Transformations, What can the history of revolutions in military affairs tell us about transforming the U.S. military*, (Santa Monica: National Defense Research Institute, Rand, 1999), p. 9 (emphasis in original).

¹² *Ibid*, pp.12, 20.

At the same time, "transformation in one area of military affairs does not...mean the irrelevance of all others." The revolution brought about by the introduction of nuclear weapons did not "render conventional forces obsolete." While the rise of the aircraft carrier, made the battleship less central to naval power in the Second World War, the battleship was widely used in that war and in many conflicts since, including the Gulf War.¹³

The RAND study also offers some cautions based on historical experience. RMAs can provide "immediate military advantage" to the first nation that exploits them in war but are not always brought about by dominant players. They are often adopted and more fully exploited by someone other than the nation inventing the new technology. This was the case with the tank, which originated with the British in World War I, but was first fully exploited by the Germans at the beginning of the Second World War. Not all RMAs involve weapons. Railways had profound impact creating a competency to move large numbers of troops further and faster. Not all RMAs are successful, at least not initially, some take time. All successful RMAs appear to have three components, technology, doctrine, and organization.¹⁴

Many of the new technologies associated with the RMA have yet to be fully proven in war. For example, it is argued by some that long-range, highly accurate weapons, cruise missiles or those launched from aircraft, will be able to deal with massed armored attacks, thus doing away with the need to counter such attacks with equally massed armor and traditional artillery. But there is as of yet no example to date of massed armor being halted by Precision Guided Munitions (PGMs).

The contemporary RMA is said to involve a number of "technology/ device/ system/ operational employment concept combinations" which have or could change ways of waging war. One of these is the capacity for "long-range precision fires." Here highly accurate long-range weapons employ ground, air, and space-based sensors and command and control system which can dominate warfare obviating the need to close in order to destroy the enemy. The RMA is also associated with "information warfare." The outcome of battles may depend on the ability to protect one's own information systems while at the same time disrupting those of the enemy. Then there is the concept of the RMA being a "system of systems." The idea here is that by combining a "vast assemblage of intelligence collection, surveillance and reconnaissance (ISR)" with "advanced command, control, communications, computers and intelligence processing (C4I)" and "precision-weapon systems," the result is a whole with capabilities "much greater than the sum of the parts." Beyond this would be the "network-centric warfare" concept which envisions the meshing of the information grid, the sensor grid and the engagement grid. Finally, the United States Navy (USN) has developed the concept of a "cooperative engagement capability." Here combat systems on geographically separated platforms would share "measurement data associated with rapid timing and

¹³ Cohen, "A Revolution in Warfare," p. 51.

¹⁴ Hundley, *Past Revolutions*, pp. 14-5.

precision to enable the battle group to operate as one..."¹⁵

Because the impact of new technologies has not clearly resulted in paradigm shifts which have altogether rendered obsolete core competencies of major powers, it may be more useful, as Andrew Marshall of the U.S. Department of Defense's Office of Net Assessment does, to speak about a "potential" or "emerging" RMA "a hypothesis about major change taking place in the period ahead, the next couple of decades."¹⁶ At the same time many of the new technologies associated with the RMA are evolving at a "gradual rate," and "their sum total, when combined to form an integrated military force...could still prove revolutionary."¹⁷

The present RMA does encompass certain new technologies that have evolved from previous ones. Indeed, it is "the culmination in modern military organizations of a variety of developments, some of them dating back decades."¹⁸ But "rapid, violent, and, above all, unpredictable change" has happened before and may yet happen with the RMA.¹⁹

Stephen Biddle, in a lengthy analysis and critique of current claims that an RMA has already fundamentally altered the nature of war, also argues that the new technologies have yet to prove themselves. He points to the Gulf War noting that the new technologies employed would have been far less effective against a more skilled adversary which did not make so many errors as did the Iraqi forces. But Biddle also questions whether a fundamental revolution is going to take place. "A non-RMA projection, calling for a future of only incremental change is more consistent with the facts."²⁰

For Biddle, the key is not so much technology but the ability to skillfully use it. It was Germany's emphasis during the inter-war years upon training, education, and adaptation which made its use of tank warfare so effective in the early days of the Second World War. He acknowledges that war has become more complex since 1900 and that those unable to "cope with this ever-increasing complexity have been exposed to the increasing lethality of modern weapons and have suffered increasingly severe consequences." Those that have, however, found ways to manage, have been much less exposed:

¹⁵ *Ibid*, p. 77-9.

¹⁶ *Ibid*, p. 20.

¹⁷ Michael O'Hanlon, "Can Technology Bring U.S. Troops Home?" *Foreign Policy* (113) (Winter 1998-99), p. 79.

¹⁸ Cohen, "A Revolution In Warfare," p. 41.

¹⁹ *Ibid.*, p. 54.

²⁰ Stephen Biddle, "Assessing Theories of Future Warfare," *Security Studies* (8) (Autumn 1998), p. 4.

“The result has been a progressively widening gap in the real military power of organizations that can and those that cannot cope with complexity, but little change in the outcomes of wars fought between equally skilled opponents and no revolutionary discontinuities in the nature of warfare.”²¹

Biddle agrees that technological advancement will “provide increasingly one-sided outcomes in major theater wars.” But he notes that, as the Gulf War demonstrates, “such wars are already very one-sided” and “it is not clear that a continuation of this trend would provide any meaningful difference.”²²

More importantly, Biddle contends that technological change in and of itself “is neither necessary nor even conducive to success.” The relationship between technological complexity and battlefield success “has not been significantly altered by recent developments and is unlikely to be changed by technologies on the drawing board.” As with Cohen, he points to the importance of skill in managing technological changes in warfare. In the 21st century, war will “be mainly a continuation of a century long increase in the importance of skill in managing complexity.” The effectiveness of technologies will still depend on human behavior “and especially on the counter-measures adopted by the technology’s targets to reduce their exposure.” Tanks have become more lethal and have greater ranges, but complex counter-measures can reduce the effects of their fire-power and compel them to move at less than capable speeds. And skilled combatants will learn to provide fewer lucrative targets for the deep attack technologies heralded by RMA enthusiasts.²³

Biddle’s views on the importance of skill and human behavior in managing technological to military advantage are confirmed in Timothy Thomas’ recent analysis, “Kosovo and the Current Myth of Information Superiority.” He points out that in spite of NATO’s “near total information superiority, its battlespace awareness was manipulated by Serbian forces more often than expected. When human and software interpreters of intelligence information were fooled, it resulted in munitions wasted on fake or incorrect targets and in bad assessments of the actual situation on the ground.” Mission tasks and damage assessments were also affected.²⁴

As revealed in Congressional testimony, the American and allied personnel were not prepared to conduct information operations. In some cases there was a lack of skills in targeting, intelligence analysis, and translation. “Information superiority” he concludes, “allowed NATO to know almost every thing about the battlefield, but NATO analysts didn’t always understand

²¹ *Ibid.*

²² *Ibid.* pp. 30-1.

²³ *Ibid.*, pp. 12, 31.

²⁴ Timothy L. Thomas, “Kosovo and the Current Myth of Information Superiority,” *Parameters* (30) (Spring 2000), p. 13.

everything they thought they knew.”²⁵

Even if armed forces master the operational skills associated with the RMA, the outcome of warfare may not become more predictable. The spread of RMA related technologies will make it difficult to assess the balance of power to the extent that it is based on the expected outcome of armed confrontation. Opacity in the matter of military power may prove one of the most troubling feature of the RMA:

“As platforms become less important and the quality of munitions and, above all, the ability to handle information become more so, analysts will find it ever more difficult to assess the military balance of opposing sides...the revolution in military affairs may bring a kind of tactical clarity to the battlefield, but at the price of strategic obscurity.”²⁶

In other words, while the well-known physical attributes of the RMA technologies may make it easier to predict what weapons are capable of doing in specific military operations, the spread of those technologies will make it more difficult to assess what the outcome of conflict will be. In this sense, the spread of technology would introduce a new measure of uncertainty into power relationships, even on the part of those countries which nominally possess the most advanced of the RMA technologies. This may impose caution on these states. At the same time, the general uncertainty engendered by this “strategic obscurity” may lead to a more unstable international strategic environment at odds with the interests of the United States and its allies.

As noted above, the enthusiasm about the RMA is only in part technological. Much of it is political and it is closely linked to the American desire to maintain its global dominance. This points to what some authors have called a fundamental asymmetry in the international strategic environment. The United States has overwhelming power in terms of the capability to intervene in foreign conflicts on a global scale. At the same time, “an asymmetry of interests” suggests “a policy of noninvolvement since so few contemporary conflicts seem to put in jeopardy key U.S. interests and therefore warrant the commitment of U.S. forces with the attending risk of casualties.”²⁷ But in fact the RMA can be viewed as being specifically tailored to a world in which America faces few direct threats to its vital interests, but may nevertheless wish to intervene in order to prevent a spread of conflict, to support allies, or for humanitarian reasons. It promises that technology can reduce the costs of unipolarism in both peace and war.

²⁵ *Ibid*, p. 14.

²⁶ Cohen, “A Revolution in Warfare,” p. 53.

²⁷ Thierry Gongora and Harald von Riekhoff, “Introduction: Sizing Up the Revolution in Military Affairs,” in Thierry Gongora and Harald von Riekhoff, Eds, *Toward a Revolution in Military Affairs? Defense and Security at the Dawn of the Twenty-first Century*, (Westport, Conn.: Greenwood Press, 2000), p. 17.

Integral with its technological implications for national security policy and the future of warfare, the American RMA has promoted much discussion about changes in doctrine and military organization. Doctrinally, the emphasis is on “decisive victory and friendly casualty limitations,” in an effort by the military “to balance military and political power with military societal compatibility.”²⁸ The RMA doctrine also suggests that America will be able to apply force anywhere in the world even with reductions in overseas bases in peacetime and smaller forces, especially ground troops, in war. The lure of the RMA is that it “promises a way to overcome what many military men believed were the reasons for our loss in Vietnam.” It not only results in minimal casualties but “even constrains the media’s ability to portray the war other than the way the generals want it.”²⁹ The RMA also fosters the notion that the United States can further reduce its overseas permanent bases. “How much nicer it would be,” notes Michael O’Hanlon, “if U.S. troops could stay home until called upon in a crisis or conflict. Then according to RMA believers, they could lash out rapidly, inter-continently, and lethally from bases” utilizing space power and long range air power.³⁰

The United States is rejecting preparation for a long war because of the dangers of a protracted conflict including public discontent. The National Military Strategy states explicitly that “Everything is staked on a short, decisive war,” in which adversaries are rapidly defeated. “Failure to halt an enemy invasion would make the subsequent campaign to evict enemy forces from captured territory much more difficult, and costly. Such failure would also weaken coalition support, undermine U.S. credibility, and increase the risk of conflict elsewhere.”³¹ The doctrine is said to be applicable in a variety of scenarios and that large scale, protracted war would become less likely, as the RMA “translated into more options in the application of military force in low intensity conflicts or operations other than war.” (OOTW)³²

This doctrine may result in a new division of labour between the United States and its allies or coalition partners. Already somewhat apparent in the Balkan interventions, this trend would see the United States contribute high tech capabilities such as long-range precision strike, global logistics, space capabilities, and information dominance, while regional allies would provide the bulk of the troops, especially for peace-keeping duties after target country or groups were subdued

²⁸ David Jablonsky, *The Owl of Minerva Flies At Twilight: Doctrinal Change and Continuity and the Revolution in Military Affairs* (Carlisle Barracks, PA: Strategic Studies Institute U.S. Army War College, 1994). p. 57.

²⁹ Blank, “How We Will Lose the Next War with Russia,” p. 122.

³⁰ O’Hanlon, “Can High Technology Bring U.S. Troops Home?”, p. 74.

³¹ As quoted in Stephen Blank “The Illusion of a Short-War,” *SAIS Review* (20) (Winter Spring 2000), p. 136.

³² Gongora and von Riekhoff, “Introduction,” p. 3.

by American RMA forces.³³ This may well be what Washington, and especially the Congress and the people, are expecting from the RMA and what allies fear.

The doctrinal imperative of quick victory, combined with the impact of rapid communication, suggests that the lines between traditional levels of warfare, and their associated echelons of command, will become blurred or “permanently erased.” There will be a melding of the strategic, theatre (operational), and tactical levels. Combined with the information warfare aspects of the RMA, this will create a requirement for commanders at all levels to know what is going on at all levels.³⁴ This does not mean, though, that “micro-management” of these operations will disappear and more responsibility will fall to lower command levels. Indeed, as Cohen points out, the technologies associated with the RMA, which would literally allow the overall commander of an operation (and/or the politician) to see what the pilot in the cockpit sees, may actually increase the tendency of the highest echelons to involve themselves in tactics.³⁵ Where conflicts are being fought for limited objectives, and where concern about collateral damage to civilians and high casualties could be important, the RMA may well make micro-management very tempting. This new doctrine is to be applied to all aspects of military operations, including various forms of peacekeeping and non-combat missions where decisiveness and political considerations will be particularly important.

In order to exploit the benefits of technology and achieve the doctrinally mandated decisive results, it has been argued that military organization will itself have to change. This is not to say that armies, navies, and, above all, air forces will disappear as distinct organizational entities. At the same time, the implementation of RMA technologies is likely to hasten an already apparent trend, at least in western armed forces, away from large conscript militaries to smaller forces wherein a premium will be placed not upon the combat experience of the personnel, especially the officer corps, but upon technical and management skills. And the RMA with its rapid transmission of information right down to the tactical level, may, as it has done in business, remove the need for layers of military middle management in the conduct of operations.

RMA advocates also argue that when forces need to be deployed, new technologies and organization will make them much more effective. For example, as Thierry Gongora notes, the United States Army has tried to integrate information technologies, by digitalizing the structure and equipment of its forces. In one 1997 exercise, the 4th Infantry Division showed that in comparison with regular formations, “the digitalized” division, “inflicted more than twice as many enemy casualties, in half the time, over three times the normal battle space using 25 percent fewer combat platforms.” Western armed forces will seek this kind of capability “in the twenty-first century to

³³ *Ibid*, pp. 7-8.

³⁴ Jablonsky, *The Owl of Minerva*, p. 29.

³⁵ Cohen, “A Revolution in Warfare,” p. 49.

make up for their decreasing size.”³⁶

To implement RMA doctrine, much emphasis is placed in the United States upon “jointness” compelling the Army, Air Force, and Navy to work together. Since the Goldwater-Nichols Act of 1986, and especially after the Gulf War, this has been almost dogma in U.S. defence planning for overseas operations. In October 1999, the United States Atlantic Command, based in Norfolk, Virginia was renamed, United States Joint Forces Command, (USJFCOM), The new command, is to serve as “the joint development owner” for the entire American military “responsible for developing the methodology to deploy all military forces for rapid and decisive military force power projection from the continental United States.”³⁷

In 1994 Jeffrey Cooper argued that the United States must go beyond jointness to integration in order to obtain the full benefits of the RMA. The perspective must be changed “from improving the individual elements of combat power...to integrating and focusing the power of the ‘whole’. Integration of the whole rather than enhancement of the parts is the central pillar of this RMA,” and “the campaign plan and joint operations” are the “defining level for measuring effectiveness.”³⁸

The short-war dominated RMA doctrines may be an “illusion” and a dangerous one. Trying to convert technology into “lasting” operational and strategic superiority may simply invite potential opponents to resort to strategic surprise or pre-emption as in the case of Japan’s attack on Pearl Harbor. Strategic decisions have not been speeded or revolutionized by the RMA and Washington will be surprised again as it was in Somalia and Kosovo and with regard to ballistic missile proliferation. History shows, that “forces optimized for fast-paced, intensive, but brief war had to fight protracted and unwinnable wars of attrition that exacted enormous costs and domestic dissatisfaction. When the United States advertises its intention to avoid protracted wars, it makes that outcome more likely than not.”³⁹

There are also doubts about a revolution in military organization. As the RMA has taken hold, it appears that predictions about fundamental changes in military organization have proven to be premature, especially in the United States. Stephen Blank notes that, “The continuing rivalry among the services is one aspect of U.S. military life that has not been revolutionized by the RMA.”

³⁶ Thierry Gongora, “The Shape of Things to Come: Sizing up the Revolution in Military Affairs,” in David G. Haglund and S. Neil MacFarlane, Eds, *Security, Strategy and the Global Economics of Defense Production*, (Montreal: McGill-Queen’s Press, 1999), p. 40.

³⁷ “USACom Redesignated to U.S. Joint Forces Command,” *Marine Corps Gazette* (83) (November 1999), p. 8.

³⁸ Jeffrey Copper, *Another View of the Revolution in Military Affairs*, (Carlisle Barracks, PA: Strategic Studies Institute U.S. Army War College, 1994). pp. 34-5.

³⁹ Blank “The Illusion of a Short-War,” p. 142.

Each service now makes claims that it can deliver the sought-after decisive, cost-effective and bloodless blow. All three services have created new organizations for doctrine development. "In fact" observes Blank, "this atavistic squabbling contradicts the U.S. armed forces professed creed of jointness."⁴⁰

That there remains considerable academic debate about the RMA's technological, doctrinal and organizational aspects is not surprising. Similar debate has accompanied most major changes in the nature of warfare. Some of the predictions came true, others did not. In the absence of a major war involving states with RMA capabilities, much will remain in the realm of speculation, however well informed. The inconclusiveness of this debate notwithstanding, the RMA has already had an impact on the way states perceive the international security environment, including the future of arms control.

ARMS CONTROL AND VERIFICATION: THE LESSONS OF THE COLD WAR

Absent from much of the debate over the RMA's meaning for the future of warfare is its impact on arms control. This has two dimensions. First can the elements associated with the RMA be subject to any kind of arms control regime? Second, how will the RMA affect efforts to control WMD? In considering these questions an overview of the lessons of the Cold War is instructive.

The advent of nuclear weapons at the end of the Second World War escalated the destructive potential of warfare to a new level and also gave impetus to the search for means to control this "absolute weapon." In theory, given the nature of nuclear weapons, it might have seemed that they would have been readily amenable to arms control for several reasons. First of all, relative to conventional weaponry, the number of nuclear weapons, and the platforms to deliver them was relatively small. Second, given the destructive power of a single device, the addition of more weapons to the arsenals did not seem to logically enhance national security. Third, while both the Soviets and Americans certainly planned to use these weapons in war, their utility was always circumscribed. Beyond deterrence, and if deterrence failed, the waging of central war, it was never clear how nuclear weapons could be employed effectively. As Henry Kissinger is said to have remarked when accused of giving the Soviets too many weapons during the Strategic Arms Limitation (SALT) negotiations, "What in the name of God is superiority? What is the significance of it, politically, militarily, operationally? What do you do with it?"⁴¹

But if the nature of nuclear weapons seemed to make them so logically ripe for arms control, those same characteristics militated against control. Given the small numbers, it was difficult to

⁴⁰ *Ibid*, p. 136.

⁴¹ As quoted in Laurence Martin, "The Role of Military Force in the Nuclear Age," in Laurence Martin, Ed., *Strategic Thought in the Nuclear Age* (Baltimore: The Johns Hopkins University Press, 1979), p. 7

agree on quantitative reductions for fear that, remaining forces would become vulnerable and that the surety of being able to inflict unacceptable damage on the side which struck first would be compromised. For many critics in the United States, Robert McNamara's decision to fix the number of ICMBs at 1054, left America vulnerable—a charge that would be repeated in the 1970s as President Carter sought to negotiate substantial reductions.

To be sure, inter-service rivalries in the United States, especially between the Air Force and the Navy, helped in part to drive force building, and increase the number of weapons. But concern about the stability of deterrence was also an important factor. In redundancy lay survivability and therefore the credibility of deterrence. This was the rationale behind McNamara's push for the development of nuclear-powered Ballistic Missile Submarines (SSBNs) with their Sea Launched Ballistic Missiles (SLBMs). In the 1970s, qualitative improvements to the relatively small arsenals, helped reduce the need for quantitative improvements. Thus both sides, sought to enhance the flexibility of their weapons and associated command and control systems in order that they would be able to hit a wider range of targets. But this in turn led to increased numbers as more weapons were needed to achieve flexibility. Developments in targeting combined with progress in satellite surveillance, allowed for greater accuracy, as with the advent of Multiple Independently-targeted Re-entry Vehicles (MIRVs), which at once reduced the need for more launchers while increasing the number of warheads, thus making arms control even more difficult. It was in fact Kissinger who worked to keep MIRVs off the table during the SALT I negotiations. Throughout the Cold War, arms control was frustrated because both sides sought to enhance the survivability, flexibility and accuracy of their respective strategic nuclear arsenals.

There was another more intangible factor that militated against nuclear arms control, especially in the early part of the Cold War. Arms control had acquired a bad name during the period between the world wars. Not only had it failed to control arms, but it seemed to become part of the anti-appeasement lessons drawn by the western democracies from the history of those years. Faced with rising militarism and rapid rearmament in Germany and Japan, (the "rogue states" of the era) the West should have been building weapons if it wanted to avoid another world war, not trying to control them with what turned out to be useless treaties so disdainfully ignored by those bent on war. The watch word was, if you want peace, prepare for war, even nuclear war. This suspicion of arms control as a solution to meeting threats from states who cannot be trusted to keep agreements, colours current arms control efforts and lends support to the RMA.

In one important sense, though, concern about fostering instability through arms control, was a self-fulfilling prophecy. While the nuclear arms race was surely primarily a product of the global rivalry between East and West, that rivalry was itself fuelled by competitive force building. Both sides viewed the growth and technologically improved sophistication of the other's arsenal as proof of intent, if not for war, then at least for the enhancement of political influence through the threat of war.

One of the key arguments of this paper is that the future is likely to witness *both* force building in support of the RMA and arms control efforts to mitigate some of its potentially

dangerous and destabilizing effects. The history of the Cold War appears to support this view as it was a period which witnessed *both* nuclear force building, driven in part by technological innovation and continual efforts at control. Indeed, within a year after dropping the bombs on Japan, Washington was leading a campaign to bring about multilateral control of the spread of nuclear weapons.

In 1946, the American government proposed the Baruch Plan, that advocated the supervised abolition of atomic weapons and the international monopoly of nuclear research and nuclear production for civilian purposes. The process was to be controlled by the International Atomic Development Authority (IADA). Though apparently generous, it would have subjected the Soviet Union to a nuclear world on American terms. Not surprisingly the offer was quickly rejected.⁴² Between 1955 and 1972, various attempts were made to bring out an end to the arms race. In general both superpowers perceived any offer for control as a political strategy to either eliminate a weapon category if one side felt behind, or freeze a weapon category if one side held a clear dominance.⁴³

The politics, indeed it might be said the theatre, of arms control politics, sometimes resulted in a temporary flurry of diplomatic activity with little substantive result. But, although reductions in superpower arsenals remained staled, arms control in selective areas was possible throughout the Cold War. Despite the demise of GCD (General and Complete Disarmament), a number of UN sponsored treaties were signed during the 1960s. In 1963, the Limited Test Ban Treaty denied states from conducting any further nuclear tests under water, in the atmosphere, or in outer space. This was followed in 1967 with the United Nations Outer Space Treaty .

Other important accords were also reached in the late 1960s. After five years of hard negotiations, the Latin American Nuclear Free Zone Treaty was finally signed in 1967, followed by the Non-Proliferation Treaty (NPT) in 1968. This treaty included extensive and intrusive on-site verification measures by the International Atomic Energy Agency (IAEA) for those countries which signed. France and China did not sign the NPT however, nor did several other near-nuclear states. In 1974, India exploded its first nuclear weapon, signifying the limits of the NPT in controlling the spread of nuclear weapons to countries and regions which posed a particular threat of further proliferation and possible use. Because the NPT also required the nuclear weapons states to seek reductions, something that was very slow in coming, the Treaty became for some states a symbol of the double-standard which the West, and especially, the United States applied when it came to arms control.

⁴² J. Baylis, J. and K. Booth, K. et al. *Contemporary Strategy: Theories and Policies*. (New York: Holmes and Meier Inc.1982), pp. 93-6.

⁴³ G.H. Quester, *Nuclear Diplomacy*. (New York: Dunellen Press, 1970), p. 23.

In the case of other weapons, such as chemical armaments, the United States "consistently" favored "the strictest possible verification of arms control measures." It would present papers at disarmament conferences "which detailed the technological capabilities of the methods available and evaluated their strengths and weaknesses." As one academic noted,

"The degree of verification required by the United States was based upon its perception of the threat posed to national security by the arms in question and the likelihood of undetected violations. For example, the United States accepted the limited (and in U.S. opinion largely symbolic) verification provisions contained in the Biological Weapons Convention and the Environmental Weapons Convention, because it did not think it was likely that weapons of this nature would be developed for modern arsenals. Verification in these conventions consisted of procedures for cooperation and consultation between parties and recourse to the Security Council in case of unresolved complaints. The United States rejected similar proposals for verification of a chemical weapons accord, noting that the threat posed by these weapons, already in the arsenals of some states, demanded stricter, more assuring verification measures, including on-site inspection."⁴⁴

A renewed effort in arms control began in the early 1970s and was met with some success. The Convention on the Prohibition of Biological Warfare and of the Production of Biological Weapons was opened for signature in April 1972.

That same year, the United States and the Soviet Union finally reached agreement on the first Strategic Arms Limitation Treaty and the Anti-Ballistic Missile (ABM) Treaty. Reflecting the brief period of detente, SALT I, along with revisions concluded in 1974, essentially ratified the existing numerical balance, sanctioned nuclear parity yet left the door open for further modernization. Both sides were pressing ahead with MIRVs. Space-based and other surveillance technologies which had become part of the nuclear arsenals, were employed to assure National Technical Means (NTM) of verification. More important from an arms control perspective was the ABM Treaty which eventually limited both sides to one strategic missile defence system thereby assuring mutual vulnerability and, it was hoped, prevent an uncontrolled offensive weapons building race.

Having stabilized the strategic nuclear balance, the West now turned to the long-standing conventional imbalance in Europe, an imbalance which partly accounted for North Atlantic Treaty Organization's (NATO) continued reliance upon nuclear deterrence and its first use strategy. The talks on Mutual and Balanced Force Reductions (MBFR) in Europe began at the end of 1973. Difficult and protracted, the talks were bogged down in the definitions of balance and equal security. Further problems were encountered in the decision of which weapons to reduce, how reductions were to be phased, and the verification of these reductions. The negotiations met with little success.

After SALT I, the international political atmosphere became adverse to arms control. In the

⁴⁴ Ellis Morris, *The Superpowers and Verification in the United Nations Committee on Disarmament*, (paper written for Government of Canada, DSS File No. 21T.080-4-003, Serial OST84-00123, October 1984), pp. 43-4.

United States, critics charged that detente and the SALT process had been a ploy by the Soviet Union, which continued to modernize its strategic nuclear forces. Fears arose that the USSR was planning to fight and win a nuclear war and in a few years it would be able to use its SS-18 "heavy" Intercontinental Ballistic Missiles (ICBMs) to inflict a successful first strike on America.⁴⁵ Moreover, Soviet activity in the Third World was seen as a violation of the supposedly implicit understanding that in exchange for ratifying parity through arms control, Moscow would behave and co-operate on other issues.

All of this made arms control particularly difficult for the Carter Administration which had come into office promising to achieve major reductions. Upon entering office President Ronald Reagan immediately adopted a hard line against the Soviet Union, commenting "both the current and the new Soviet leadership should realize aggressive policies will meet a firm Western response."⁴⁶ Reagan replaced SALT with the Strategic Arms Reduction Talks (START) in the early 1980s, as his government perceived the former as an "offer to trade an apple for an orchard."⁴⁷ Seeking to replace the long-standing policy of basing American security on the threat of retaliation, the Reagan administration launched the Strategic Defense Initiative (SDI) in 1983 and the Soviet Union spent much of the rest of the decade responding to SDI.

In general, arms control during the Cold War can be said to have had four broad objectives: to reduce the risk of atomic war, to reduce the damage should war occur, to reduce the burden of defence expenditure and to provide a greater measure of strategic and political stability between states. Efforts to reduce or control arms failed, or did not meet expectations, not because such attempts were always at odds with the objectives of force building, but on the contrary, because nuclear force building had the very same four objectives. It was supposed to reduce the risk of war by providing a credible deterrent to opposing nuclear forces and, in the case of NATO, to conventional attack. While predictions about damage limitation were always suspect, both the Americans and the Soviets devised systems whose purpose was to limit damage should nuclear war occur, either by striking first or by executing more accurate and limited strikes. The nuclear arsenals and associated command, control and intelligence infrastructures were expensive, but at least in the beginning they were viewed as less costly than conventional forces. Finally, the nuclear balance of terror, based upon mutual deterrence, was seen as providing for a measure of stability between the superpower antagonists and also within their spheres of influence.

Not only did arms control efforts and nuclear force building appear to have the same

⁴⁵ See, for example, Richard Pipes, "Why the Soviet Union Thinks It Can Fight and Win a Nuclear War," *Commentary* (64) (July 1977).

⁴⁶ Eureka College Commencement Address, *Weekly Compilation of Presidential Documents*, (May 9, 1982), pp. 599-604.

⁴⁷ *Ibid*, p. 601.

objectives, but the record of strategic nuclear arms control, at least until the rapid progress brought about by the end of the Cold War, tended to reinforce the centrality of nuclear force building in relations between the superpowers. Strategic nuclear arms control was possible in the early seventies because it meshed well with the security objectives of the superpowers. In this sense, the ABM Treaty and SALT I marked a significant step towards the establishment of parameters around which the superpowers maintained a balance of power. Neither side could seriously claim a first-strike capability. At the same time neither side was content to rest with the existing technologies that lay behind mutual deterrence. The search for new systems continued. The nuclear balance was never considered technologically static even if strategically a measure of stability appeared to have been achieved.

The SALT process, including the ABM Treaty, only served to entrench nuclear weapons, including advances in technology such as MIRVing, ever more firmly into the international system thus perpetuating the role of strategic nuclear weapons. The success of agreements rested upon the expectation that both sides would be left with what each believed was a necessary force level and composition, leaving the door open to further technological improvements. As Laurence Martin observed in 1979, "However frequently misunderstood, strategic arms limitation is not an alternative to giving nuclear weapons a major role in international politics, but merely one way of defining that role."⁴⁸

That nuclear weapons had a role in international politics was clear. What was not clear was how, where and when they would be used. The military balance was characterized by the 'usability' paradoxes of nuclear weapons, those, imponderable, self-contradictory concepts that were never resolved, and which clouded much of the thinking about security and strategy in the Cold War. Among them was the notion that while the Soviets and the Americans both sought to avoid waging nuclear war, the mutual deterrent postures created to achieve this end were based upon the capabilities and plans of each side which were designed to fight and win such a war. Whether the only outcome was MAD (Mutual Assured Destruction), each side adopted a NUTS (Nuclear Utilization Target Selection) approach.⁴⁹ It was assumed that these postures lent credence to the threat of nuclear war because it was believed that nuclear weapons deterred only if there was a possibility that they would have been used. This, however, led to another paradox. Although deterrence was strengthened by mutual perceptions of use under certain circumstances, it was believed that it was dangerous to make nuclear weapons so usable that anyone was tempted to actually employ one.⁵⁰ It was on this basis that arms controllers regarded the introduction of tactical nuclear weapons and so-called "flexible options," as inherently dangerous because they may have

⁴⁸ Martin, "The Role of Military Force in the Nuclear Age," pp. 5-6.

⁴⁹ These concepts are drawn from Spurgeon M. Keeny Jr. and Wolfgang Panofsky, "MAD Versus NUTS: Can Doctrine or Weaponry Remedy the Mutual Hostage Relationship of the Superpowers," in Charles W. Keegly Jr. and Eugene Wittkopf Eds, *The Nuclear Reader: Strategy, Weapons, War* (New York: St. Martin's Press, 1989).

⁵⁰ Harvard Nuclear Study Group, *Living With Nuclear Weapons* (New York: Bantam, 1983), p. 34.

fostered the notion that nuclear weapons could be used and therefore would be.

But the paradoxes went further. Despite, and indeed perhaps because of, all their efforts to enhance the war fighting capabilities of their strategic nuclear arsenals, the nature of the weapons could not easily be ignored. There were few illusions on either side of the catastrophic risks that would attend the execution of nuclear war plans, which served to reinforce mutual deterrence. As Bernard Brodie observed: "It is the curious paradox of our time that one of the foremost factors making deterrence really work, and work well, is the lurking fear that in some massive crisis it might fail. Under these circumstances, one does not tempt fate."⁵¹

To a certain extent the paradoxes of nuclear weapons made arms control possible, even while they restricted its scope. Quantitative limits were feasible, although qualitative improvements were continually sought, because numbers alone did not necessarily confirm advantages. The disutility of nuclear weapons in many conflict scenarios may have contributed to efforts to curb proliferation through the NPT process.

In the Cold War the role of strategic nuclear arms control between the superpowers, and to a certain extent general efforts to halt the spread of nuclear weapons through the NPT process, "was to confirm an international power structure. For this reason, agreements tended toward a general counting exercise."⁵² Moreover, what could be counted by national technical means or by agreements allowing for on-site inspection, were amenable to arms control where the political will existed to reach bilateral or multilateral agreements. Not surprisingly, attempts to limit conventional weaponry were impeded in part because of the difficulties associated with verification.

As the Cold War came to an end, arms control negotiation and verification entered a new phase. Real reductions in superpower weapons were now possible because of the changed international strategic environment. But it was how that environment changed that really accounted for both the pace and character of the new arms control measures.

The 1987 Intermediate-Range Nuclear Forces (INF) Treaty eliminated a whole class of weapons on both sides of the European divide, but went a long way to achieving the NATO objective of removing the strategic and political threat posed by the Soviet SS-20s while leaving the Alliance with adequate theatre capabilities. Most importantly, the on-site verification measures of the Treaty not only gave it credibility, but clearly showed that the Soviets were abandoning their traditional aversion to intrusive measures. Moscow had to reduce defence spending and seek more stability as a result of domestic weaknesses that needed to be addressed.

⁵¹ Bernard Brodie, *War and Politics* (New York: Macmillan, 1983), pp. 430-1.

⁵² Lawrence Freedman, "The Revolution in Strategic Affairs," *Adelphi Paper* (318) (London: International Institute of Strategic Studies, 1998), p. 70.

In November 1990, after some unilateral Soviet withdrawals of conventional forces from Eastern Europe, the Conventional Forces Europe (CFE) Treaty (the post-Cold War successor to the MBFR talks) was signed. It mandated massive reductions in conventional forces in NATO nations and the by then unraveling Warsaw Pact. Its provisions included broad intrusive verification measures and transparency in future posture decisions. By September 1994, "over 18,000 items of treaty limited equipment (TLE) had been destroyed including 6,000 from the Russian Federation," with "no evidence of a concerted effort by any party to cheat or intentionally mislead inspection teams."⁵³ Here again, the agreement seemed to favour NATO for whom the large Warsaw Pact land armies had been the prime strategic threat.

The end of the Cold War also allowed for real reductions in strategic nuclear weapons, once more on terms that benefitted the United States. Under START I, not only were overall levels brought down but the Soviets agreed to cut in half their heavy SS-18 ICBM arsenal, an objective Washington had been seeking since the 1970s. Under the unratified START II agreement, overall levels are to be reduced to 3,500 warheads. Under the START III proposals, Presidents Clinton and former president Yeltsin agreed to negotiate reduced warhead levels to about 2,000 each.⁵⁴ More importantly from the American view, START II eliminates all MIRVed ICBMs, including the remaining SS-18s. The treaty however, leaves both sides able to deploy MIRVed Sea Launched Ballistic Missiles (SLBMs) and this provides the United States with an edge. Its fourteen Ohio-Class Ballistic Missile Submarines (SSBNs), which carry the Trident II D-5 SLBM constitute half of America's deployed strategic warheads. Moreover, the D-5 is a highly accurate weapon allowing "for targeting of hard and soft targets."⁵⁵

With the end of the Cold War American arms control concerns took on a new dimension in order to make sure that the weapons scheduled for destruction were in fact destroyed, especially given that many were now on the territories of newly independent states. The Nunn-Lugar Cooperative Threat Reduction Program provided, amongst other measures, for extensively intrusive U.S. on-site measures to supervise the denuclearization of Belarus, Kazakhstan and Ukraine. Other undertakings dealt with elimination of chemical and biological weapons in Russia, as well as "safe and secure" storage of fissile material.⁵⁶

⁵³ Jeffrey D. McCausland, *The CFE Treaty: A Cold War Anachronism?* (Carlisle, Penn. U.S. Army War College, Strategic Studies Institute, 1995), p. viii.

⁵⁴ Robert A. Manning, "The Nuclear Age: The Next Chapter," *Foreign Policy* (109) (Winter 1997/98), p. 73.

⁵⁵ Brian Bates and Chris McHorney, *Developing a Theoretical Model of Counterproliferation for the 21st Century* (Lewiston, N.Y.: The Edwin Mellen Press, forthcoming). p.59 (Emphasis in original). Permission to quote has been obtained from the authors.

⁵⁶ *Ibid*, p. 56.

The nature of the arms control measures were the result of the end of the Cold War and how it ended. The weakness and ultimate fall of the Soviet Union allowed the United States to obtain arms control agreements and associated verification measures, especially on site-verification, on the kind of favourable terms it had been seeking since 1945. This reinforced the idea that arms control and its methods of verification, are closely connected to, are a reflection of, the existing power relationships. The CFE Treaty and the START agreements, and the nature of the verification measures associated with them were seen, not without a certain justification, as the result of the West's "victory" in the Cold War.

This is not to argue that the CFE and START treaties were simply imposed upon a reluctant Soviet Union and now Russia in the way the Versailles Treaty of 1919 and the unconditional surrender of 1945 were forced upon a defeated Germany. These were mutually sought-after and beneficial agreements, as all successful arms control agreements must be. By the mid-1980s it was becoming clear that Moscow was interested in concluding arms control arrangements so that it could address important domestic matters. The Soviet willingness to consider more far-reaching agreements back-up by more intrusive verification measures, also undermined resistance to arms control within parts of the U.S. government and bolstered the views of American allies such as Canada that greater flexibility was possible without compromising Western collective defence. The fact that Russia has now ratified START II and continues to hold to the CFE, and appears willing to continue the arms control process, indicates that we have entered an era in which a new, broader consensus exists on what is possible and desirable.

For the West this consensus is important. Having obtained the kind of agreements that were made possible by the end of the Cold War, it also has stake in seeing them succeed for the sake of its own security interests. To be sure, the agreements represent both a desire to ease tensions with Russia and a latent, if not always openly stated, fear of a revival of animosity between East and West. It is because of the very difficulty and delicacy of the situation that arms control has become integral to allied security and its hopes for stability in Europe. The last thing NATO needs now, especially in light of its expansion eastward and Partnership for Peace (PfP) program is the uncertainty that would be brought out by a weakening of conventional and nuclear arms control measures arrived at during the last ten years. This mutuality of interests reinforces the reductions of the global threat that began in the early 1990s and holds out the promise that the Cold War will not soon return. In this sense arms control has both encouraged further stability even as it is a product of it.

In considering the history of arms control during the Cold War and its relevance to the RMA a number of considerations need to be kept in mind. First, these are "conventional weapons" and thus unlike the nuclear arsenals of the Cold War they do not fit into the usability paradoxes of nuclear weapons. They are being developed and deployed primarily on the expectation that they will be used and not as much on the basis of calculations about deterrence, mutual or otherwise. They are to be used in crisis rather than tempt fate by not acting. In this regard, they cannot be equated with the large conventional forces which NATO and the Warsaw Pact maintained during the Cold War and which were reduced under the CFE Treaty. These forces were developed to complement the

nuclear arsenals. The role of the conventional weapons in Europe in the presence of nuclear weapons suffered from its own contradictions and uncertainties. The most important "threshold" was not that between nuclear and conventional war, but between crisis and war itself. If deterrence had failed, it can be argued that it would have meant failure at all levels since NATO's nuclear forces were intended to deter conventional as well as nuclear attack. NATO's "flexible response" strategy always seemed to be more an agreement amongst allies not to disagree over strategy for the sake of allied unity than a prediction of how a war would actually be fought. While neither side wanted to rely entirely upon mutual nuclear deterrence, it was always highly suspect that there could be a protracted conventional war in Europe.

Second, there is the multiplicity of weapons systems and associated command and control technologies of the RMA as well as a variety of scenarios in which they might be used, something that was not the case with nuclear weapons. This suggests that any effort to control the RMA will encounter many of the difficulties associated with conventional arms control.

Third, while RMA forces cannot be considered the same as the strategic nuclear forces of the Cold War, it is interesting to note that similar claims are being made for them. That is they do have deterrent value, they limit damage if war takes place, they are cost-savings in terms of larger conventional forces and they have a positive impact upon global and regional stability. In other words, the RMA is attractive because it holds out the prospect of providing enhanced security for the leading RMA nation, the United States. This alone may make efforts to control it difficult, just as it did for nuclear weapons. Fourth, as with nuclear weapons, it is evident that, whatever its operational effectiveness, the mere existence of the RMA and its associated technologies, doctrines and military organizational changes are increasingly being entrenched into post-Cold War international politics. Finally, the record of arms control during the Cold War suggests that even if certain important agreements can be reached on a mutually beneficial basis, the technology of warfare continues to progress. This is something that needs to be kept in mind with regard to the RMA which has placed so much emphasis on the importance of pursuing continual technological innovation.

ARMS CONTROL AND THE RMA: THE PROBLEM OF PROLIFERATION

Because of some of its characteristics, the RMA presents specific problems for arms control for which the lessons of the Cold War may be of limited value. To begin, the proliferation problems associated with the RMA cannot be separated from what Keller and Nolan call the "new proliferation" of arms world wide which they see as the direct result of the dominance of market forces, as opposed to political strategic considerations in the sale of arms. Whereas in the Cold War the transfer of arms and the technologies to build them were used to secure allies and influence, particularly by the United States. Today "almost everyone sells almost anything to just about anyone who can pay-and often to some who cannot." Without "enforceable multilateral restraints, the invisible hand has become the principal mechanism for allocating conventional weapons and associated technology on a global scale." Moreover, the globalization of weapons and technologies

“is a form of proliferation that threatens the emerging framework of agreements on weapons of mass destruction...”⁵⁷

While many new sellers have entered the market, the United States with 43 per cent of world-wide arms trade remains dominant. Indeed, despite statements that Washington regards the spread of weapons as a threat and the establishment by Congress of a Presidential Advisory Board on Arms Proliferation, American policy since the mid-1990s has been to promote the sale of its weapons and advance technologies abroad in part to compensate domestic producers for reduced sales to the U.S. military. In announcing his policy in 1995, President Clinton “explicitly sanctioned” arms exports as a way “to enhance the ability of the U.S. defense industrial base to meet U.S. defense requirements...at lower costs.” According to Keller and Nolan, “The absence of policy in the world’s largest arms dealer has given way to a global frenzy of marketing.”⁵⁸

The market factors driving the current arms trade are particularly relevant to the RMA. In looking into the arms control and verification issues raised by the RMA, one important feature of the transformation, whether evolutionary or revolutionary, is the fact that many of the technologies that drive it are civilian in origin as indeed many technologies were in the past. As Cohen points out, the end of the Cold War and the “efflorescence of capitalism” in the U.S. and in many other countries, has in a sense “freed up the markets in military goods and services. Countries can gain access to a wide spectrum of military capabilities for ready cash, including the services of skilled personnel.”⁵⁹ Because of this “the potential will exist for new military powers to emerge extremely rapidly.” Nations such as Japan and China will be able to “translate technology power into its military equivalent.” During the Cold War, military industry was an “exotic and separate entity.” With the RMA, “the pendulum has begun to swing back, and economic strength may again prove easily translatable into military power.”⁶⁰

Another factor in spreading the RMA is that there is a certain “observable” characteristic about it. Progress on various systems, the results of research and development is widely reported in the specialized and popular press, especially the arms trade journals. Firms operating in the worldwide arms market, both legitimate and clandestine, have an incentive to spread the most recently available improvements. Military establishments which see themselves as inferior because they do not have the most recent technology, will attempt to “leap frog” the dominant players and

⁵⁷ William W. Keller and Jane E. Nolan, “The Arms Trade: Business As Usual?”, *Foreign Policy* (109) (Winter 1997-98), p. 113.

⁵⁸ *Ibid*, pp.117-8.

⁵⁹ Cohen, “A Revolution in Warfare,” p. 43.

⁶⁰ *Ibid*, p. 51.

may not necessarily do this covertly.⁶¹

To a certain extent, the proliferation of RMA technologies, at least the most advanced versions, will be limited by resource and budget constraints. Some of America's European and Asian allies will be in the best position to follow the U.S. lead in acquiring the systems either through indigenous manufacture or, because they are allies, through transfer. This will especially be the case if Washington believes that such a transfer will enhance interoperability. Most countries, will be unable to afford or integrate the systems and may seek out cheaper systems, particularly where certain types of technologies can be adapted from those available in the civilian market. At the same time,

“while certain capabilities for intelligence, communication and targeting are becoming widely accessible, other remain highly specialized and at a degree of sophistication that is unavailable outside the higher military spheres, including the most advanced forms of system integration. In general there will be hybrid conventional capabilities, acquired selectively and in an uneven and uncoordinated fashion.”⁶²

Because of concern that advantage may be lost, any attempt to limit the spread of RMA technologies will likely be the result of efforts on the part of those states, the United States and its principal allies, to try and curtail the spread of its most advanced technologies rather than with efforts “at international regulation of the relevant markets.”⁶³ Even here there may be difficulties and even once advanced systems become more readily obtainable. As with Cohen, Lawrence Freedman also points to the cruise missile, “the paradigmatic weapon of the RMA.” It can be launched from a variety of platforms. The Missile Technology Control Regime (MTRC) which seeks regulation through a common export policy and includes systems able to carry chemical, nuclear or conventional weapons, now has 29 states. But, other types of delivery systems, such as “aircraft and cruise missiles used with stand-off platforms” are outside the scope of the MTRC.⁶⁴ The regime “cannot cope with aircraft-and many of the components of cruise missiles that are similar to those of aircraft.”⁶⁵

In July 1996, 33 countries signed the Wassenaar Arrangement on Export Control for Conventional Arms and Dual Use Goods and Technologies. Efforts have been made to strengthen the agreement. But as Keller and Nolan noted, this agreement “has received scant attention from the policy community and ridicule from the arms lobby and it is presently languishing with no high-level

⁶¹ Hundley, *Past Revolutions*, p. 37-8.

⁶² Freedman, *The Revolution in Strategic Affairs*, p. 70.

⁶³ *Ibid.*

⁶⁴ Spear, review, p. 547.

⁶⁵ Freedman, *The Revolution in Strategic Affairs*. p. 71

involvement. Wassenaar does not have the 'teeth' to control arms exports."⁶⁶

As Freedman concludes "Most RMA-type technologies can neither be readily counted nor verified, and therefore do not fit into any of the traditional sorts of arms-control agreements." The problems of verification are compounded by the "civilianization of many important forms of collection and transmission." Only some of the "esoteric counter-measures and counter-counter measures may be kept from general release."⁶⁷

Presently, the United States is able to employ RMA technologies "to defeat most potential aggressors with disproportionately low casualties to itself, at least, in cases of interstate conflict of the type that directly affects its core national interests."⁶⁸ Yet the technologies associated with the RMA could be adapted by powers "that fear U.S. military intervention" and want to find the means to deter or counter it.⁶⁹ Because of the wide availability of at least some of the technologies, the RMA may well create "pockets of military capability" that will allow small states to frustrate the attacks of larger ones with overall more sophisticated militaries. Certain "microsystems" such as cruise missiles can inflict damage on aircraft carriers, while attacks on computer systems could hamper the transmission of information.⁷⁰ As Krepinevich points out,

"...the growing threats posed by cruise and anti-ship missiles and ballistic missiles, advanced satellite technologies for communication that are available to any paying customer, sea mines and advance diesel submarines, physical and electronic vulnerabilities of information and communications systems on which the U.S. armed forces increasingly depend, and the proliferation of chemical and biological weapons..could make it much harder for the United States to reach foreign ports safely, keep those ports as well as airfields and other infrastructure safe from enemy attack, and protect its troops on the battlefield."⁷¹

As the technology spreads, it would come to benefit smaller and regional powers more than the United States. Indeed, continued development may "be more likely to erode U.S. superiority than shore it up." John Arquilla of the Rand, argues that, "American military power lies so far beyond its nearest competitors today that it seems senseless to pursue the latest technological advances--especially as their introduction will no doubt lead to the erosion of existing advantages through

⁶⁶ Keller and Nolan, "The Arms Trade," p. 123.

⁶⁷ Freedman, *The Revolution in Strategic Affairs*, p. 71.

⁶⁸ Michael O'Hanlon, "Beware the 'RMA'nia'," <www.brook.edu/views/articles/ohanlon/1998/ndu.htm>, p. 7.

⁶⁹ Gongora and Riekhoff, "Introduction," p. 18.

⁷⁰ Cohen, "A Revolution in Warfare", p. 53.

⁷¹ O'Hanlon, "Beware the 'RMA'nia'," p. 8.

process of diffusion to others.”⁷² As Thomas asks, “What will happen when a real information warfare system confronts ours. Will our capabilities be degraded by a quarter, a third or more?”⁷³ This might lead, over time, to “more multi-polarity than U.S. leadership of world affairs,”⁷⁴ exactly what the RMA is supposed to forestall.

Not surprisingly then, the United States is working on developing counter-measures to the expected “counter-power projection strategies” of targets of American intervention. The *Joint Vision 2010* doctrine “as well as some recent technological solutions for early entry forces,” indicates that the Americans “do not expect the next regional war to present conditions for power projection as auspicious” as those found in the Gulf War.⁷⁵ And, according to Thomas, future conflicts may also be very different from the experience in Kosovo:

“Future enemies could possess some of all of the following: an adept air force; up-to-date air defense sites; precision-guided cruise missiles that can do to our bases and planes what we can to theirs (to include destroying AWACs); and the ability to reach the United States with weapons of mass destruction, precision missiles, or terrorists acts. When these threats confront US and NATO systems, what will information superiority do for us? Will it be even more unreliable when stressed by both nontechnical offsets and technological counters?”⁷⁶

The diffusion of technologies has already promoted the search for the next generation of RMA to counter the existing and emerging technologies. From an arms control perspective, it is not the validity of all the claims about the RMA, or the persuasiveness of the many doubts that a revolution is taking place. Rather it is the fact that technologies are being developed which in turn may elicit responses, which will in turn heighten the search for ever more advanced versions of the RMA. In this sense, the proliferation of RMA technologies shares with the nuclear arms race the characteristic that it has acquired a technology driven momentum of its own which may not be entirely related to substantive military or political threats.

THE RMA AND ARMS CONTROL: REGIMES, METHODS AND SYSTEMS

If the RMA has fostered a measure of obscurity and uncertainty, rather than clarity in the future of warfare, it has done no less when it comes to arms control. In part this is the result of the

⁷² As quoted in O’Hanlon, “Beware the ‘RMA’nia,” p. 8.

⁷³ Thomas, “Kosovo and the Current Myth of Information Superiority,” p. 28.

⁷⁴ Gongora and von Riekhoff, “Introduction,” p. 18.

⁷⁵ *Ibid.*

⁷⁶ Thomas, “Kosovo and the Current Myth of Information Superiority,” p. 28.

reality that, despite all the commentary and analysis, there is no consensus on what the RMA means. If it is in fact a revolution, then the force of technological change and what it offers, may be no more amenable to control than most previous innovations in weaponry. If what is taking place is just evolutionary, then it may be all the more difficult to subject to arms control since the RMA will involve continual incremental technological progress designed specifically to enhance force multiplier effects.

If the RMA is seen as a combination of weapons and associated technologies, military organization and doctrine, it is evident that arms control is primarily concerned with the first component. Yet, while arms control regimes may not deal directly with changes in military organization and doctrine the fact that these are generally observable can be said to support the control of the RMA to the extent that such changes may signal that countries are developing RMA-related capabilities. Here, arms control method of "collateral analysis" and two very simple "systems" of verification can be useful, literature survey and international information exchange through various methods, including public announcements. The organization of armed forces, particularly in the West is no secret. Governments including, and especially, the U.S. government, are quite open in terms of how their militaries are structured. Indeed, with regard to the RMA in particular, there is much public fanfare about the re-organization of services and commands to better utilize the technologies of the RMA. Moreover, there is a plethora of open secondary sources, such as *The Military Balance*, and various defence industry-related journals, which track in detail the world's militaries. As for doctrine, here too a great deal is in the public domain. The military services of a number of countries regularly publish doctrine in unclassified sources and the professional military journals are filled with various doctrinal debates on the RMA.

It is the technologies and the weapons based upon them that would need to be regulated if the RMA was to be subjected to any kind of verifiable arms control regime. Some of the problems with this have been discussed above. A good deal of the technology comes from the civilian sector, particularly the computer industry. Advances in micro-processing of information have been married to familiar weapons systems such as missiles, aircraft and naval platforms which are themselves acceptable weapons or already, as in the case of missiles difficult to control under existing regimes such as the MTCR. Then there is the large realm of command, control, communication and intelligence technologies that support the weapons and give them their improved accuracy and lethality.

The susceptibility of RMA weapons and technologies to traditional arms control methods, systems and regimes is presented in Table One which uses the approach taken by Cleminson's and Gilman's 1981 study, *A Conceptual Working Paper on Arms Control Verification*.⁷⁷

As indicated in the table there are many difficulties that would be encountered in trying to

⁷⁷ F.R. Cleminson and E. Gilman, *A Conceptual Working Paper on Arms Control Verification* (Ottawa: Department of External Affairs, 1981).

establish a regime that would be able to verify agreed upon controls on the RMA. As the platforms and the C4I technologies upon which they rely are clearly within the realm of conventional weaponry, negotiating a treaty would be problematic. What would be outlawed and why? Precision-guided weapons and cruise missiles and the ability to target and control them are at the heart of the RMA weaponry. Control of computer-related technologies would require more extensive and continual intrusive on-site verification than contained in the NPT and biological weapons agreements. There is space-based surveillance technology for NTM available to support any treaty, but what would it be looking for and could it find it? In the meantime, those countries which have an edge in this area, such as the United States, are interested in using it to monitor the spread of WMDS and rogue state advances in RMA.

Yet while it may not be able to subject the RMA to an verifiable arms control regime, this does mean that governments and international organizations are at a complete disadvantage when it comes to monitoring the proliferation of RMA-related weapons. As noted above, much is known and in the public realm. The problems would come when efforts were made to use this information to establish a credible arms control regime, one that would actually limit the spread of RMA weapons technology. The shortcomings of the traditional systems, including satellite surveillance and the need for unprecedented, and likely unacceptable, levels of intrusion to make the regime credible, strongly limit prospects for such an agreement.

Any effort to control the RMA would also encounter a major international political hurdle one directly related to the RMA itself with its American dominance and American concerns. As noted above, the United States has much to lose if the technologies which it now counts upon spread undermining its ability to apply force quickly and with minimal cost. To this extent Washington has an interest in curtailing the proliferation of RMA technologies. Moreover, any credible arms control regime for the RMA will require the surveillance systems and intelligence gathering techniques of the United States.

However, an American-led and dominated effort to create an international regime designed to curtail the spread of the RMA would have many of the problems now associated with the NPT. It would in essence seek to deny to other countries the weapons systems which the United States and its allies believe they should maintain for the sake of their own interest. In addition, Washington is likely to be selective on the issue of proliferation. It will want its allies to have some of the RMA capabilities it now has in order to solidify security ties and enhance interoperability. In other words, an arms control regime which truly limits the spread of the RMA will work to the advantage of the United States.

RESPONSES TO THE RMA, NUCLEAR WEAPONS, WMD AND COUNTERPROLIFERATION

The difficulties of controlling the RMA might be acceptable if other dimensions of arms control were not adversely impacted. This brings up the second major consideration associated with

the RMA, the problem that it will undermine efforts to control nuclear weapons and other WMDs.

The end of the Cold War made progress in nuclear arms control possible, but it also raised questions about the continued utility of nuclear weapons. Some of those raising these doubts, offer the RMA as the solution. Krepinevich argues that the new military technologies and the nature of post-Cold War threats, "principally regional Bosnia-type ethno-nationalist conflicts or Iraq-type regional conflicts...mean that the utility of the U.S. nuclear arsenal will likely be eclipsed by the capabilities of a host of emerging conventional and electronic weapons." Former State Department Advisor and the author of *Toward a Post-Nuclear Ethic*, Robert Manning, suggests that America's "emerging high-tech" conventional capabilities "point to a sharp de-emphasis of nuclear weapons in U.S. defence planning."⁷⁸

Much has been done to de-emphasize nuclear weapons. Manning cites the INF treaty of 1987, the near ninety per cent reductions in American and Russian arsenals under the START treaties, the Nunn-Lugar program, the indefinite extension of the NPT and the Comprehensive Test Ban Treaty, (CTBT) as reasons for optimism.⁷⁹

The nuclear complications of the RMA are part of the larger WMD problem. Along with the hopes and confidence inspired in America by the RMA, its doctrine and efforts at new military organization, has come what Gongora calls "the nightmarish prospect of asymmetric conflicts." Manning, refers to a new "wave of proliferation" brought about by the very success of the Gulf War, arguing that countries "who lack major power allies and are faced with overwhelming conventional force may seek utility in the logic of deterrence that guided the superpowers in the Cold War."⁸⁰ Bates and McHorney state explicitly that the "dominance of the American military may...actually *encourage* the acquisition and use" of WMD.⁸¹ Moreover in considering the arms control implications of the RMA, it is important to examine the "complex links between the proliferation of weapons of mass destruction and the trade in conventional weapons."⁸²

As German scholar, Oliver Thrant notes, the proliferation of biological weapons to countries in the southern hemisphere "might give the later the idea that they can use such weapons

⁷⁸ Manning, "The Nuclear Age:," p. 74.

⁷⁹ *Ibid.* p. 72.

⁸⁰ *Ibid.* p. 79.

⁸¹ Bates and McHorney, *Developing a Theoretical Model of Counterproliferation*, p. 31. (Emphasis in original).

⁸² Joanna Spear review of *Managing Non-Proliferation Regimes in the 1990s: Power, Politics and Policies* by Peter Van Ham (New York: Council on Foreign Relations Press, 1994), in *Contemporary Security Policy* (17) (December 1996), p. 457.

as an effective tool against the superior armed forces of the U.S. and other industrialized countries.”⁸³ The United States as “the only remaining globally active superpower is especially affected by the threat of the proliferation of biological weapons, because a major dimension of American strategy is the “prospect of being able to exert influence in areas of conflict in which U.S. national interests are considered at stake.” But it is the fear that certain “rogue” states may “adopt an asymmetric strategy” as a means to counter “American conventional military prowess” and thus “make it hard or even impossible for American forces to gain access to theatres of conflict by resorting to biological warfare.” The use of biological weapons would make it difficult for Washington to contain a regional conflict. Had Iraq used such weapons against Israel, it may have called forth a Israeli nuclear reprisal. In addition, Washington might find it difficult to rally coalition partners in any effort in which biological weapons might be employed by a country as they could be subjected to retaliation. “In sum,” notes Thranert, “the time is past when industrialized countries could intervene in conflicts far from their own shores at relatively low cost.” He adds that because of the so-called “‘CNN effect’ the American public will reject interventions, whether at the outset or after considerable losses have been sustained in biological weapons campaigns.”⁸⁴ In other words, the proliferation of biological weapons directly calls into question the claims made by proponents of the RMA.

Moreover the control of biological weapons in the presence of the RMA is particularly problematic. They are more of a threat than chemical weapons given that they are relatively inexpensive and uncomplicated to produce, use techniques available in the open market for civilian biotechnology products, do not need to be stored in large quantities and are “incomparably easier to conceal than are nuclear or chemical weapons programs.” “Without doubt” he concludes, arms control cannot be the only instrument for countering the threat posed by the proliferation of biological weapons.”⁸⁵

In a recent study published by the Brookings Institution, *Technological Change and the Future of Warfare*, Michael O’Hanlon also raises doubts about the prospects of new methods of controlling WMD. He argues that existing technologies and those likely to emerge in the next twenty years will be insufficient to detect concerted efforts to develop WMDs on the part of those states who wish to develop them. Sensors have limited ranges when it comes to the detection of nuclear materials. With regard to biological threats, lasers and other electromagnetic beams that might be used against deadly aerosols once released, cannot penetrate the buildings, vehicles and containers where they would most likely be stored, while finding them in a timely fashion presents difficulties as the United Nations Special Commission (UNSCOM) “ on-site experience in Iraq has

⁸³ Oliver Thranert, “Nuclear Weapons: A Deterrent to Biological Warfare?” in David G. Haglund, Ed., *Pondering NATO’s Nuclear Options: Gambits for a Post-Westphalian World*, *Queen’s Quarterly* Special Edition (Kingston, Ont.: 1999), p. 87.

⁸⁴ *Ibid.*, p.91.

⁸⁵ *Ibid* pp. 90, 92.

demonstrated.”⁸⁶ And UNSCOM, one of the most comprehensive and intrusive arms control efforts, unlike most international inspections, was initially backed up by the threat of retaliatory air strikes when Iraq balked. Even then, it was eventually forced to withdraw.

One approach to the perceived problems of arms control in dealing with WMD which has been adopted, particularly by the United States, is what is referred to as “counter-proliferation”. The distinction drawn by Washington between nonproliferation policies and counter-proliferation policies is subtle but not insignificant in terms of multilateral arms control efforts. A 1994, memo from the National Security Council (NSC) Special Assistant to the President and Senior Director for Non-proliferation and Export Controls to the Assistant Secretary of State for Political-Military Affairs and to Ashton Carter, then Assistant Secretary of Defence for Nuclear Security and Counter Proliferation stated that:

“Proliferation is the spread of nuclear, biological and chemical capabilities and the missiles to deliver them. ...Non-proliferation is the use of the full range of political, economic and military tools to prevent proliferation, reverse it diplomatically or protect our interests against an opponent armed with weapons of mass destruction or missiles should that prove necessary. Non-proliferation tools include intelligence, global non-proliferation norms and agreements, diplomacy, export controls, security assurances, defences and the application of military forces. ...Counter-proliferation refers to the activities of the Department of Defence (DOD) across the full range of U.S. efforts to combat proliferation, including diplomacy, arms control, export controls and intelligence collection and analysis, with particular responsibility for assuring U.S. forces and interests can be protected should they confront an adversary armed with weapons of mass destruction or missiles.”⁸⁷

The Clinton administration’s latest national security strategy statement declares the “spread of dangerous technologies” as a threat to American interests and pledges to support arms control measures to address this threat.⁸⁸ In 1994, the President declared it to be “an unusual and extraordinary threat to the national security, foreign policy and economy of the United States.” A September 1999 report by the National Intelligence Council warned that the spread of medium-range missiles represents an “immediate, serious and growing threat” to American and allied forces.⁸⁹ While non-proliferation policies have been adopted to deal with these threats, the American view is that the spread of WMD and missiles to rogue states and possibly terrorist groups, constitutes the

⁸⁶ Michael O’Hanlon, *Technological Change and the Future of Warfare*, (Washington D.C.: Brookings Press, 2000), pp. 162-4.

⁸⁷ As quoted in Brian Bates and Chris McHorney, *Developing a Theoretical Model of Counterproliferation*, p.201.

⁸⁸ United States, The White House, *A National Security Strategy for a New Century* (Washington, D.C.:December 1999), p. 2.

⁸⁹ Bates and McHorney, *Developing a Theoretical Model*, pp. 12, 14.

“failure” of non-proliferation policies in these cases and thus the need to resort to counter-proliferation. In a 1993, speech to the Committee on International Security and Arms Control of the National Academy of Science, the U.S. Deputy Assistant Secretary of State for Counter-proliferation announced the launching of the Counter proliferation Initiative (CPI). This was reflective of then Secretary of Defence Les Aspin’s Bottom-Up Review (BUR) of defence policy which took note of the changed international circumstances brought about by the ending of the Cold War and the “ability of the United States to limit the proliferation of weapons of mass destruction.” Aspin concluded “that preventing proliferation with the policies of persuasion and denial would be less effective in the 21st century for the United States.” Thus the BUR identified the need for counter-proliferation of WMD.⁹⁰

The CPI seeks to prevent the spread of WMDs, to “roll-back” their acquisition, to deter their use, to adopt defensive measures, such as greater protection for U.S. forces, when they were used and if necessary to take “offensive measures” to deal with proliferation. It called the changes to the strategies and composition of American forces to allow them to “successfully” respond “to major regional contingencies that involve” states who might be armed with WMDs. In the 1995 Unified Command Plan, the Joint Chiefs of Staff issued a memo which “delegated the mission of countering proliferation” of WMDs “to the military commanders responsible for regions considered to be at high risk.”

The Clinton administration is planning to spend as much as \$12 billion on protecting its armed forces and civilian population from WMD attacks. This includes a program to “prepare large and medium size cities for handling chemical and biological attacks.” In May 2000, the Justice Department and the Federal Emergency Management Agency “simulated a series of mock biological and chemical terrorist attacks in program involving thousands of people and closely watched by top U.S. officials-to test the readiness of local, state and federal governments to handle potential crises involving WMD attacks.” There is the growing view, expressed by Central Intelligence Director George Tenet that the counterproliferation efforts against the spread of WMD weapons, “has been gradually losing ground.” The “challenge is to find policies to deter the use of these weapons, develop countermeasures,” such as NDM, “and plan on handling crises that might arise should WMD be released.”⁹¹

The new United States Joint Forces Command has been given responsibility for “homeland defense” including “providing military assistance to civil authorities for consequence management of weapons of mass destruction incidents within the continental United States, its territories and possessions.” It will also “support the WMD consequence management efforts of the other

⁹⁰ *Ibid*, p. 16.

⁹¹ “Weapons of Mass Destruction: A New Dimension in U.S. Middle East Policy,” *Middle East Review of International Affairs* (4 June 2000) on-line edition.

combatant commands” through the world.⁹² In setting up USJFCOM, Secretary of Defense William Cohen, appointed an Army National Guard Brigadier-General as the first commanding general of Joint Task Force-Civil Support (JTF-CS). “The JTF-CS will ensure Department of Defense assets are prepared to respond to requests for support from a Lead Federal Agency such as the Federal Emergency Management Agency.”⁹³

The CPI includes working with other countries and international organizations, and Presidents Clinton and Yelstin issued a declaration on the need to deal with proliferation. These U.S. policies were adopted by NATO, which established three proliferations groups, the Joint Committee on Proliferation, the Senior Political Military Group on Proliferation and the Senior Defence Group on Proliferation. But while the CPI found support amongst American allies and developed countries, the developing world saw it as “exacerbating national security concerns by widening the gap between the military capabilities of the developed and developing countries.”⁹⁴ John Simpson points to “the development by the U.S. of military options for counter-proliferation purposes” and the development of tactical and strategic defence systems, as a source of friction between the nuclear weapons and non-nuclear weapons states, with regard to the future of the NPT.⁹⁵

Of interest from a non-proliferation standpoint, is the relationship between the RMA and the CPI. It is evident that the United States will employ its RMA technologies in defensive and offensive measures designed to deal with states or groups who might acquire and use WMDs. In this sense, the salience of nuclear weapons would diminish and further cuts would be possible. This in turn could assist the NPT by allowing for further cuts in the American nuclear arsenal. But as discussed below, it also appears that the counter-proliferation objective could serve to reinforce the continuing utility of nuclear weapons, thus in turn undermine non-proliferation efforts.

The failure of the Senate to ratify the CTBT indicates a reluctance in some quarters in the United States to go further on arms control. Moreover, as Manning himself notes, average annual spending on nuclear weapons research and development in the United States by the Department of Energy (DOE) and the Atomic Energy Commission, which was \$3.7 billion during the Cold War, is expected to average \$4.6 billion over the period 1998-2008. And this does not include Department of Defence costs “or those associated with the production of nuclear weapons materials.” In 1996, “DOE’s research development, testing and materials production programs were reclassified as

⁹² USACom Redesignated to U.S. Joint Forces Command,” , p. 8.

⁹³ “Guard General to Command Joint Civil Support Task Force,” *National Guard*, (53) (November 1999): p. 12.

⁹⁴ *Ibid*, pp.33-39.

⁹⁵ John Simpson, Daryl Howlett and Emily Bailey, “1997 and All That: Multinational Diplomacy and the Nuclear Non-Proliferation Regime,” *Contemporary Security Policy* (17) (December 1996), p. 341.

'stockpile stewardship' and weapons production was reclassified as 'stockpile management'."⁹⁶

Perhaps more importantly, several studies done in the United States have suggested the need to retain a nuclear weapons capability, including a first-use option, against adversaries with the potential for WMD or even conventional forces that could inflict damage on American forces and interests. In 1992 The Strategic Deterrence Study Group, argued that the United States could not "count on [conventional deterrence] to deal with many lethal Third World threats...and also supported the 'first-use' of nuclear weapons if American military forces are confronted with superior conventional forces 'at remote places around the world'."⁹⁷

In November 1997, President Clinton issued a new U.S. Nuclear Weapons Employment Guidance as contained in Presidential Decision Directive 60 (PDD-60). It declares that the United States would no longer be required to fight and win a protracted nuclear war. Bates and McHorney point out that PDD-60 is "relevant to counter proliferation because it supports the possible employment of nuclear weapons against a country that uses chemical or biological weapons against American military personnel or civilians." The exact contents of the document remain secret but,

"If available information about PDD-60 is accurate, the new policy would definitely lower the threshold for the use of nuclear weapons. Some analysts fear that PDD-60 may encourage other nations to acquire nuclear weapons as a means of deterring chemical and biological attacks. The use of nuclear weapons against a non-nuclear weapon state would invalidate security assurances given by the United States to signatories of the Nuclear Nonproliferation Treaty."⁹⁸

The Clinton administration has tried to allay fears about PDD-60 and its impact on non-proliferation policy. In 1998 it openly assured allies and Russia that it has "no plans or intention of using nuclear weapons against Iraq." However, it also stated that it "did not rule out in advance any capability available to use." "Thus," conclude Bates and McHorney, "the Clinton Administration failed to rule out the use of nuclear weapons against a non-nuclear-weapon state."⁹⁹ And this option remains part of the counter-proliferation approach.

Even authors who stress the disutility of nuclear weapons in view of the Bosnia-type conflicts and the threat of non-state actors that are likely to be the norm, suggest a use for nuclear weapons. Manning, for example, points out that nuclear weapons might still be needed in a "counter-proliferation mission" such as "a preemptive attack upon a buried weapons of mass destruction

⁹⁶ Manning, "The Nuclear Age," p.78.

⁹⁷ Bates and McHorney, *Developing a Theoretical Model*, p. 40.

⁹⁸ *Ibid.* p. 47.

⁹⁹ *Ibid.* p. 48.

research facility that would be invulnerable to conventional weapons.”¹⁰⁰

Thranert agrees that giving nuclear weapons a role in deterring biological weapons for example “runs counter to other nonproliferation and arms control aims.” Not only would such a policy set a problematic example for curtailing the spread of nuclear weapons, it would indeed go against long-standing American pledges (in support of the NPT) not to use nuclear weapons against a non-nuclear weapons state. Nevertheless,

“Strategically, it is understandable that the US would not wish to rule out nuclear deterrence against the use of biological weapons. Were it officially to renounce the resort to nuclear weapons as a counter to the use of biological weapons by hostile forces, this could be taken by some countries as a virtual invitation to concentrate on the development of biological weapons. There remains, therefore, an irresolubly conflicting relationship between the objectives of arms control and the requirements of strategy. Seen in this light a...nuclear order in which such weapons have been abolished, seems many years in the distance if for no other reason than that the US believes it needs nuclear weapons for reasons stemming from its quest to deter the use of biological weapons.”¹⁰¹

O’Hanlon also doubts that American military superiority “is great enough to permit strictly conventional military responses to any battlefield use of weapons of mass destruction against American forces.” There are uncertainties about whether the U.S. military can maintain its present superiority or whether it could cope with chemical, biological or nuclear attacks on its forces and bases. He agrees that the U.S. “military advantage over most potential foes is great enough that American forces could probably prevail without resorting to the use of nuclear weapons.”

“However, they would most likely do so at a price of high U.S. casualties. Rather than accept high casualties, the United States would have powerful reasons to use nuclear weapons against an enemy’s forces and military infrastructure in response, both to save its own troops’ lives and to deter further enemy attacks of that kind in the future. Making the possibility of such a response known in advance, as it did before Operation Desert Storm, could also have deterrent benefits. It could discourage a foe from the belief that it could keep the casualty-adverse United States from responding to its aggression.”¹⁰²

Paul Schulte of the United Kingdom’s Ministry of Defence, argues that despite problems with on-site verification, exacerbated by the failure of the United Nations to continue inspections in Iraq, multilateral efforts should continue to support the Chemical Weapons Convention. But he also stresses the need for counter-proliferation. He points to the efforts by NATO’s Senior Defence Group on Proliferation to improve the Alliance’s training and equipment to operate in a chemical

¹⁰⁰ Manning, “The Nuclear Age,” p. 81.

¹⁰¹ Thranert, “Nuclear Weapons, pp. 104-5.

¹⁰² O’Hanlon, *Technological Change*, pp. 165-6.

and biological weapons (CBW) environment. "This," he argues, "is a practical and valuable modification of the strategic landscape that does not need complicated multinational negotiations. These improved defenses bolster arms-control agreements" by making the use of chemical and biological weapons "less attractive to proliferators."¹⁰³ He also calls for NATO to issue a "specific declaration" at the start of "any crisis that it would reserve the right to take proportionately severe action against, or even to remove, any regime that used CBWs against it or its forces and to try the leaders as war criminals."¹⁰⁴

What Schulte is saying is that the West reserves the right to employ the most technologically advanced weaponry which the RMA can provide, but that it also reserves the right to deny potential adversaries WMDs and, if they are used, to retaliate with its own WMDs. Even he acknowledges the implications of this position:

"In the future we must expect that states or groups who see the United States-backed Western dominated world order as fundamentally unjust will feel entitled to search for equalizers against the military superiority that is the backbone of that world order. In this regard, we should not underestimate the importance of frustration and rage as drivers of chemical and biological developments...CBWs, because of their intrinsic nastiness, can act as conflict intensifiers and avenging symbols. The drive to ban CBWs, which is heavily supported by the Western allies, may appear to be a means of canceling out all remaining asymmetries that might threaten the West and thus make the world safe for dominance by high-technology conventional weapons, backed by American (or Israeli) nuclear power. Those who feel this way are not very interested in being dissuaded, and their arguments may even gain some support from the anti-nuclear lobby."¹⁰⁵

There is yet another complicating factor in regards to the arms control implications of the RMA. Non-Proliferation efforts focus on "so-called" weapons of mass destruction, nuclear chemical and biological and in recent years on their delivery systems long-range ballistic and cruise missiles. From time-to-time there are also efforts to control "weapons of ill repute," such as antipersonnel mines and fragmentation devices. But, "in a gaping logical disjunction, shorter-range missiles, combat aircraft, surface ships and submarines-all of which can deliver" WMD, "continue to be traded widely." Moreover, "a coordinated conventional attack can achieve levels of devastation associated with weapons of mass destruction, even on the battlefield." This was demonstrated in the Gulf War and the attacks on Yugoslavia. The RMA promises to increase the accuracy and lethality of conventional weapons "as future generations of platforms incorporate more sophisticated

¹⁰³ Paul Schulte, "Chemical and Biological Weapons: Issues and Alternatives," *Comparative Strategy* (18) (October-December 1999), p. 329.

¹⁰⁴ *Ibid*, p. 334.

¹⁰⁵ *Ibid*, p. 331.

electronics, mostly from commercial sectors of the global information economy.”¹⁰⁶

In this sense, the distinction between advanced conventional weapons and WMDs, becomes harder to maintain. As Keller and Nolan argue, “It is not a simple dichotomy, conventional on one side and unconventional on the other. Amongst nuclear, chemical and biological weapons there are differences in technology, levels of lethality and delivery requirements, with nuclear being harder to acquire but not to deliver:

“In short, the category “weapons of mass destruction” is based more on historical usage than on logical grounds or on an analysis of the characteristics of various weapons. But the false dichotomy between weapons of mass destruction and conventional weapons has helped to legitimize arbitrary limits on nonproliferation, both intellectually and in terms of specific treaties and regimes. If it is not a weapon of mass destruction or a missile to carry one or occasionally a weapon of ill repute, then it is presumed to have a legitimate place in commerce and warfare. Consequently, there are few if any controls over the sale of such weapons or the transfer of their underlying technologies.”¹⁰⁷

This brings up the moral dimension of the RMA. Why should its technologies be regarded as more just in terms of the conduct of war, than WMDs? While it promises to reduce civilian casualties because of the accuracy of the weapons systems, it can inflict great suffering on civilians as the weapons seek to cripple military and governmental infrastructures. So-called “minimal collateral damage” is a relative term, usually employed by the attacking forces. The NATO campaign against Yugoslavia have led some to call for allied leaders to be tried on war crimes.

Even discounting the morality of the weapons, the distinction which the United States and its allies hold to seems to make even less sense when it is considered that the exports of conventional weapons technology, which they promote, could lead to improvements in capabilities which will approximate the kind of WMDs whose proliferation they wish to stop. Combined with the moral considerations, this would seem to suggest the need to put in place the same kinds of transparency and controls on end-use for sensitive dual-use civil-military technologies which are applied to nuclear, chemical and biological weapons and some missiles.¹⁰⁸ But these have proven difficult in the past and, as noted above, may be even more so given the globalization of high technology trade and its relationship to the RMA.

All of this highlights another of the central arguments of this paper, which is that the RMA in promising to provide the West with security in a way that diminishes the salience of nuclear weapons and thus enhance the prospects of arms control, has in fact raised its own host of

¹⁰⁶ Keller and Nolan, “The Arms Trade,” p. 119.

¹⁰⁷ *Ibid*, p. 120.

¹⁰⁸ *Ibid*, p. 123.

complications and uncertainties about the future of warfare and particularly for the control of WMD proliferation. In the post-Cold War era, given the nature of possible threats and military operations, nuclear weapons seemed to lose their utility and the RMA was encouraged. The United States had developed the RMA to allow it to apply forces quickly, accurately and with minimal cost in instances where its interests require it to intervene against distant adversaries. America also, though, has raised the issue of the proliferation of weapons of mass destruction especially with regard to rogue states. Yet it is operations against these very states which is used to justify the RMA. To complete the circle, it turns out that nuclear weapons do have a utility, to deter the use of biological weapons against the United States and its forces in the event that it has to apply RMA technologies against these states.

Thus, like the nuclear arsenals of the Cold War, the RMA has its own intractable paradoxes and uncertainties, despite the fact that it involves conventional weaponry, especially with regard to questions of threshold--the point at which an RMA conventional attack would elicit a WMD response. How much damage from a conventional attack would be considered "unacceptable"? What level of likely WMD response would compel the United States not to intervene militarily?

While fear of WMD response to an RMA attack is driving much thinking in the West, it is hard to imagine any government or group tempting fate by employing WMDs against the United States or its allies. It may well be possible for small, weak states to employ chemical and biological weapons, but once this threshold is crossed, yes, all the advantages go to the larger attacking country in terms of response and in terms of the reaction of neighbouring states and the international community. "Ugliness is no proof of military utility."¹⁰⁹

Yet this only brings up the question of whether in fact the United States would cross the nuclear threshold in response to a chemical or biological attack, especially one confined to American forces in the field. If deterrence fails, how usable are limited nuclear strikes? What level of attack on American forces would be sufficient? In one sense, they are more usable simply because their use against a rogue state would not carry with it the prospect of escalation to a global strategic nuclear war. Moreover, while the use of any nuclear weapons would risk global condemnation, so would an attack upon American and allied forces that employed chemical and biological weapons. Indeed, an American nuclear response might well be viewed as a justifiable means of ending, or forestalling, further attacks and reinforcing deterrence to others who might contemplate them.

On the other hand, Blank points the particular problems of associated with a nuclear response to an RMA attack.

"All nuclear threats challenge the United States' thinking about war. U.S. doctrine and strategy aims to control war and force it into congenial forms, however nuclear war's danger

¹⁰⁹ Martin Libicki, "Rethinking War: The Mouse's New Roar?" *Foreign Policy* (117) (Winter 1999-2000), p. 34.

lies not just in its frightful devastation, but in its inherent unpredictability and freedom from true strategic control by the governments involved. While nobody knows what objectives justify nuclear use other than retaliation against nuclear weapons or against strikes upon them, a government that did not so reply to a nuclear attack would fall. That war would then become an uncontrollable total war fought for objectives far transcending the supposedly limited means and objectives that the United States professes to employ.”¹¹⁰

It is evident that responses to the RMA, by the West and by potential WMD proliferators, will complicate existing arms control measures. However, this situation should not be considered the death knell of arms control. Indeed, there may well be reasons to expect renewed emphasis on controlling WMD in the new strategic environment of the RMA. As summarized in Table 2, the existing arms control regimes will still be relevant although not always effective in all circumstances. That RMA-related technologies will not likely be subjected to arms control efforts, will upset some countries, but this will not bring a halt to efforts to control WMDs. Moreover, as noted above, the United States, for its own self-interest, is pressing for tighter controls on WMD and adopting counter-proliferation policies in the expectation that some states will use the RMA as a reason to ignore or challenge existing multilateral arms control regimes.

To argue that the advent of the RMA has the potential to encourage the proliferation of WMDs and thus create difficulties for future arms control and associated verification efforts, does not mean that this will necessarily take place. A key factor will be the relationship between individual states and neighboring countries as well non-regional states which for varying reasons may become adversaries and threaten intervention. A region of relative intra-state stability which provides no reason for intervention by major outside powers may be unaffected by any adverse effects of the RMA. Latin America may be considered in this category.

As discussed above, the real focus for concern about the impact of the RMA is with the relatively small number of so-called rogue states which are viewed by the United States, and depending on the region or country, by U.S. allies and others, as presenting a threat to their neighbors and to broader international stability. The view is that existing judicial and political arms control methods may be insufficient. It is the expectation that force may be needed to check these states that has driven much of the RMA in the United States. But it is these states which are crucial for the integrity of future arms control efforts. If the RMA should make those efforts more difficult, then the fact that proliferation is not taking place more widely may be of little significance.

THREE ALTERNATIVE STRATEGIC AND ARMS CONTROL SCENARIOS

One way of looking at the implications of the RMA on arms control is to examine three broad categories of states that the United States may face: 1) a state with significant conventional capabilities, limited RMA capacity, but an advanced WMD capability; 2) a state with less

¹¹⁰ Blank, “The Illusion of A Short-War,” p. 144.

conventional capability but significant WMD capacity; and 3) a state with *both* a limited conventional capability and limited WMD capacity. Each case can be examined from the standpoint of the effectiveness of the RMA, the possible responses by the target state and the implications for arms control. The connecting thread in all three scenarios from an arms control standpoint is that the RMA appears to provide increased, although not absolute, advantages to the United States in terms of power generated through either the latent or applied use of force compelling potential target states to either acquire RMA capabilities themselves or develop and retain WMDs. As summarized in Table 3, each presents a unique challenge for the United States both in terms of the potential application of force and arms control efforts.

A state with significant conventional capabilities and some RMA capacity, as well as advanced WMD such as Russia, China (and in the future perhaps India and Iran) will pose the greatest challenge to the use of the RMA and perhaps to arms control. In the Russian view, the RMA "degrades strategic stability." Recent changes in Russian doctrine which, as a result of Kosovo, suggests the use of tactical nuclear weapons "in a first strike response to conventional attack." Here the enlargement of NATO only contributes to this trend since it is viewed as "preparation for a future military threat that can only be countered by the threat or use of tactical, if not strategic, nuclear weapons." They fear the very type of attack which the Americans hope the RMA will afford them, one that uses PGMs and Information Warfare to threaten a government's ability "to govern or command its armed forces." Faced with such a threat, "Russia or similarly-oriented states" might indeed strike first or preemptively with nuclear systems even against purely conventional attacks." Nuclear weapons take on a renewed aura of usability, "as if they were just particularly lethal missiles," the line between nuclear and conventional is blurred and the threshold for nuclear is lowered. As Blank notes, as a result of the RMA, Russian "[n]uclear strategy and policy have become conventionalized."¹¹¹ It is the prospect that the RMA may be at odds with the goals it is supposed to achieve and in the process undermine the evolving post-Cold War consensus, to the detriment of Russian and Western security, that has prompted arms control concerns about it.

At the same time in the case of Russia and, to a lesser extent, China, the continuing fear of nuclear attacks upon the United States itself will serve as a powerful deterrent to any military action and thus the existing strategic stability and arms control regimes may remain unaffected, although both countries may attempt to acquire RMA technologies.

More concern will focus on the potential of other states, such as Iran, which may strive for category one status, especially with regard to WMDs. The potential for crisis or conflict here may be greater and it is not at all clear that the application of RMA technologies can easily overcome large conventional forces where that state has the capacity to employ them skillfully and the numbers to fight a protracted struggle, particularly one involving land forces and the need to capture and hold large amounts of territory. If this state also deploys some RMA technologies, such as cruise missiles or a capacity to disrupt communications and intelligence links, then the United States will have less

¹¹¹ *Ibid*, pp.143-4.

confidence in the kind of quick decisive victory which the RMA promises.

In the future the presence of an advanced WMD capacity in countries such as Iran would also raise the cost of any military action as it could place at serious risk not only deployed forces but the surrounding populations, including those in neighboring countries which might be drawn into the conflict. This was the fear during the Gulf War. In the most extreme case, where an Iran or Iraq had developed long-range missiles, the United States, or other allies participating in a coalition effort, would be at risk. In these circumstances, Washington might find itself deterred from taking any military action at all, especially if the issues at stake were not those of vital interest to the United States or its allies. In general, category-one states provide the United States and its allies with reasons to retain nuclear weapons as instruments of deterrence, further weakening general arms control efforts.

In order to provide protection for neighboring countries which may be friendly to the West, Washington would rely upon political pressure backed-up by its general deterrent capabilities, including nuclear weapons. The United States could, as it is already doing, organize and support multilateral non-proliferation efforts, and if necessary call for sanctions and embargoes. It could use its extensive NTM capabilities to monitor the situation and engage in unilateral counter-proliferation policies, all of which remain available with or without the RMA. But without a change in the political relationship, arms control efforts will be difficult and the cause of general arms control will not be much advanced.

In the case of states with less formidable conventional capabilities but an extensive WMD capacity, the RMA offers more potential for effectiveness since this state has fewer options in the event of a high-tech attack by the United States. However, in this category the impact of RMA attacks will vary with the size of the country and the size, sophistication and deployment of its conventional forces. It will also depend upon the amount of damage its leaders are prepared to accept. An initial RMA attack may have to be followed up by an invasion in which case the costs to the United States will rise.

If a category-two states is unable to counter the RMA with its own conventional forces and lacked the numbers to sustain a protracted conflict, but was unwilling to surrender, such a state would face the problem of whether to cross the WMD threshold. The resort to WMDs would be a last desperate measure likely to draw even more conventional attacks, if not a nuclear response. Moreover, with a weaker conventional capability, especially in the area of aerospace defence, WMD facilities would be subjected to concerted attack. Given the lack of a strong conventional capability, the uncertainties regarding the utility of WMDs, and the underdevelopment of WMDS, such a state may be more amenable, depending upon the political situation, to arms control measures. With proper inducements, it might be persuaded to sign, or more closely adhere to, an existing WMD treaty or regime and more accepting of intrusive methods of verification. Here again though, some category two states, those with larger conventional capabilities and a leadership more hostile to the West, such as Iran or North Korea, may be less receptive to WMD arms control.

Category-three states with limited capabilities in both conventional forces and WMDs are in one sense the best targets for RMA technologies as they are the most vulnerable. In addition, as they are generally weaker militarily, their political influence is likely to be correspondingly less. In another sense, with a more rudimentary conventional force, one that depended less on fixed infrastructure and concentrated forces, and in a situation where governmental institutions and communications links were already weak, RMA technologies may find few suitable targets. If these states were also prepared to accept high civilian casualties and engage in a protracted guerilla war, technological superiority may not yield a quick military victory and political settlement. A target state in this position may also make use of the new era of "globalization" Portraying itself as a helpless victim of aggression by the powerful they "have an unprecedented opportunity to manipulate the burgeoning global media to their advantage, whether by courting world opinion or undermining an adversary's domestic base of support.."¹¹²

The category three state may have limited WMD capabilities without the kind of supporting facilities that could be easily attacked by conventional forces and thus may survive an RMA attack. The willingness of the target state to engage the United States at high cost, could lower the threshold at which a limited number of WMDs were employed, especially against forwardly deployed American forces and bases. But if such a state were already able to raise the cost of intervention through conventional means, and in so doing keep the leadership in power, it is difficult to see the use of even limited WMD given the expected response.

In this case, as in the one above, external persuasion to accept limits on armaments may be possible. This will depend though on the extent to which the international community can provide security assurances, particularly if they face neighboring states which have acquired greater conventional or WMD capabilities. Ironically, one way of providing such assurances may be the RMA which in these instances would assume something of a post-Cold War mechanism for extended deterrence in the service of non-proliferation. At the same time category three state which had more rudimentary and limited WMD capabilities and whose political leadership wished to retain them as means of deterring an attack might be less receptive to becoming a party to international arms control regimes.

The United States is taking such scenarios seriously as indicated by the emphasis it is putting on both deterring and coping with WMD attacks on its forces and even the American homeland. The National Missile Defense (NMD) is justified on the grounds that it will allow the United States more freedom of action in terms of dealing with "rogue" states and providing protection if their leaders irrationally cross that threshold and use their "limited" WMD capabilities. The deterrent dimension of this approach should not be underestimated. After all, "limited" is a relative term. A rudimentary chemical attack on American forces which resulted in scores of deaths, would be considered a national disaster for a country where the avoidance of casualties has become almost military doctrine.

¹¹² Libicki, "Rethinking War" pp. 30-31.

At the same time, it should not be forgotten that there remains a large element of speculation in such scenarios, especially with regard to categories two and three. We have the record of the Gulf War, but it is inconclusive. The United States was not deterred from mounting a coalition against Iraq by the potential of WMD use against its forces. Was this because Washington was convinced that Iraq would not risk nuclear retaliation? Was Washington less sure of avoiding a WMD response if it had continued on to occupy Iraq and therefore was it deterred from doing so? In the case of the Kosovo campaign, would NATO have even mounted an attack if it knew or suspected that Yugoslavia had a limited number of WMDs? Yet how would they have been used and to what end?

The point here is that while the scenarios described above highlight some of the arms control implications of the RMA, they also draw attention to the uncertainties that remain as the United States grapples with the impact of the "revolution" it is bent on inciting.

WILL ARMS CONTROL SURVIVE THE RMA?

Whether revolutionary or evolutionary, the new technologies, military organizations and doctrines of warfare as fielded by the West, especially the United States are already having an impact on the way in which force is applied. In general, this suggests a growing military imbalance between the United States and other countries. And the expectation that more rapid advances will be made which will further widen the gap. Indeed, thinking has already begun on "The RMA After Next" with the suggestion that the next technological breakthrough will be the application of the "biotech revolution" to warfare.¹¹³ This is not surprising, since it is explicitly the goal of the American RMA effort to preserve a dominant military position and allow the United States to intervene quickly, effectively and at minimal cost overseas.

The RMA has not created new weapons or systems that are easily subjected to traditional arms control and verification. Regardless of RMA capability or not a state may still comply with or be subjected to arms control verification on WMD. Weapons that were subject to verification prior to RMA are still verifiable by the same means, even though those systems may have been altered or advanced as a result of RMA. But what the RMA has done is make the international control of WMDs more difficult because it has introduced into the international security environment enhanced conventional weapons which appear to give the United States and the West even more relative military power than they already possess and which can be used to further their own vision for global stability as they interpret it.

To this extent, the RMA seems to foretell a continuation of trends in international security relations which began with the end of the Cold War and which are generally favourable to the United States and its major allies. The major concern is that the RMA, as an instrument of Western power,

¹¹³ Lonnie D. Henley, "The RMA After Next," *Parameters* (29) (Winter 1999-2000), pp. 46-57.

may persuade some countries to retain or expand WMD capabilities as potential asymmetric responses in the event of attack by a country using RMA capabilities. This in turn will cause difficulties in maintaining, enforcing and expanding those existing arms control regimes. Not only could the inequality of those regimes be perceived as being exacerbated, but the more advanced RMA surveillance technologies could be employed to monitor compliance by NTMs as the United States responds to potential asymmetric threats.

Yet the impact of the RMA on the future international security environment and hence on arms control and verification needs to be kept in perspective for a number of reasons. First of all, while the world has witnessed some impressive applications of the RMA, during the Gulf War and the conflicts in the Balkans, it is not at all evident that it will live up to its optimistic predictions. As noted in the discussion above, the circumstances of the Gulf War were in many ways unique and there has been no repeat of such large scale inter-state conflict involving massed forces since. In Bosnia and Kosovo, the new technologies appeared to be effective in bringing about a temporary end to hostilities and compliance with NATO demands, but once the stand-off weapons did their job, more traditional forces had to be deployed, albeit with the support of new surveillance technologies. The conclusion of a permanent peace in the region seems to have little to do with the new technologies of warfare. Moreover, as Stephen Blank stresses, the promise of short decisive wars based upon technological superiority is not a certainty. States confronted with the RMA may utilize strategic surprise followed by attrition tactics.

Secondly, the international strategic environment is not just a function of weaponry and differences in relative military capabilities. The current and foreseeable future security setting will be one dominated by the United States. It will also be an environment marked by continued regional instability and ethnic conflict. The RMA is not so much a product of this environment as a response to it, in the sense that it is designed to afford America ability to intervene when it chooses. But as critics of American "boosterism" and "unipolarism" such as Samuel Huntington caution, "However much foreign policy elites may ignore or deplore it, the United States lack the domestic political base to create a unipolar world."¹¹⁴ A recent poll taken by the Chicago Council on Foreign Relations found that seventy-two percent of respondents did not believe American vital interests were at stake abroad, the lowest since 1978.¹¹⁵ This situation, combined with the fact that the vital interests of the United States are often not at risk in regional conflicts suggests that is not self-evident that the 1990s trend of U.S. interventionism will continue. Here again, a protracted involvement in the Balkans, as well the confrontation with Iraq may well temper future enthusiasm for applying force, however technologically impressive, abroad. To the extent that the RMA is linked to America's willingness to harness this capability to continued regional interventions, its import may well be less than expected.

¹¹⁴ Samuel P. Huntington, "The Lonely Superpower," *Foreign Affairs* (78) (March/April 1999), p. 40.

¹¹⁵ William Pfaff, "Today's Americans Prefer to Mind Their Own Business," *International Herald Tribune* (18 March, 1999), <www.iht.com/IHT/TODAY/THE/ED/edpfaff.2.html>

The third point is that the concern about rogue states, so much at the heart of the arguments in favour of the RMA, and the consequent worry and asymmetric WMD responses, may wane. After all, there really are only a handful of states in this position. As seems evident in the case of Iran, efforts are being made by Washington and other governments to keep open lines of engagement. There is even some movement with regard to relations between North and South Korea. If this is the case, then any detrimental impact of the RMA on arms control efforts may well be moderated and the prospects for arms control under existing regimes and methods improved. As the lessons of the Cold War indicate, the efficacy of arms control depends on political factors. An international security environment in which rogue states become less of a preoccupation for the United States and its allies, and confrontation is moderated by a lowering of threat perceptions, is one more amenable to arms control.

Fourthly, while it may not be possible to implement measures specifically directed at controlling the spread of the new technologies associated with the RMA, there is much that is readily observable. This is especially the case with regard to changes in military organization and doctrine which might accompany the new technologies. But even in the case of the weapons themselves there is a great deal of information in the open sources. Combined with the kind of surveillance that goes on continuously, it is possible for the international community to monitor the RMA, even if it is unable to create a regime to control it.

Finally the RMA will not be regarded as entirely morally neutral. As noted above, the destructive power of some of these weapons, in particular their ability to strike at the civilian infrastructures of states, will continue to impose a measure of caution on the part of the United States in how it applies unmatched military power. That Americans may well be in favour of measures to reduce their own casualties, does not mean that they impose no limits on the amount of death and destruction their armed forces can inflict, especially in cases where vital interests are not at stake. In an era of a globalized media, the "roar" of the victim mice subjected to RMA attacks may arouse sympathy in the international community.

This leads to the conclusion that although the RMA has already had an impact on the international security environment and complicated arms control, there is no reason to abandon it and good grounds to continue current efforts. It is, to be sure, easy to be cynical about arms control in the face of the evolving technologies of warfare heralded by the RMA. Cynicism, though, is not always the same as realism. Indeed it would be unrealistic to conclude that because the RMA has introduced new complications into multilateral arms control efforts that its adverse affects are so pervasive that any effort to mitigate them will be fruitless. Arms control and the methods put in place to verify it have always had to keep pace with technological advances in weaponry. Despite the inability to achieve major reductions in nuclear weapons until the end of the Cold War, real progress was made on arms control and verification with regard to other WMDs.

The future international security environment is likely to be one where *both* the RMA and arms control will present competing, but not always mutually exclusive, claims for the enhancement of international strategic and political stability. In this situation, the best that can be done is to

continue to sustain existing regimes which seek to reduce and check the spread of WMDs. These efforts will be supported by the United States for reasons directly related to its own perceptions of national security. Other countries can point out the links between proliferation and the RMA in continued efforts to curtail the spread of all weapons and steps can be taken to monitor the trade in advanced technologies. But mitigation of the adverse impact of the RMA is likely to be more a function of political trends rather than arms control considerations, even as the specific technologies advance.

The RMA, has indeed raised serious questions about the future of arms control. But it is just one of a number of dramatic political and military trends of the post-Cold War era, not all of them detrimental to global peace and security. Given the other factors that affect the international security environment, and the very uncertainties associated with the RMA, there is reason to conclude that arms control will survive the RMA.

CONCLUSION

This paper posits the following conclusions:

1. Whether the technologies associated with the RMA constitute a "revolution" in warfare as it has been understood in the past has not been conclusively resolved and indeed is unlikely to be in the absence of a major war, especially between states who have deliberately sought to implement the RMA. However, the RMA is more than just a new way of delivering weapons. It involves the application of the most advanced computer technologies to warfare and the implementation of changes in the organization and structure of armed forces. Led by the United States, the RMA has become integral to an American national security policy which, whether explicitly nationalistic or couched in the language of liberal internationalism, is designed to maintain American global dominance. The RMA has thus already had immediate impact on the international geostrategic environment.
2. If the RMA has fostered a measure of obscurity and uncertainty, rather than clarity, about the future of warfare, it has done no less when it comes to arms control. There are two related problems. First, is the susceptibility of the RMA itself to arms control and the second the adverse impact of the RMA on existing efforts to control WMD.
3. While there is much that is observable about the RMA, its weapons systems are not easily susceptible to our present arms control methodologies and technologies in manner that would allow for a credible arms control regime.
4. The RMA has made the international control of WMDs more difficult because it has introduced into the international security environment enhanced conventional weapons which appear to give the United States and the West even more relative military power than they already possess and which can be used to further their own vision for global stability

as they interpret it.

5. The Western states who have pursued the RMA in the post-Cold War era have by no means rejected arms control as a means of fostering global stability. They are concerned about the proliferation of WMD and conventional weapons. However, there appears to be a reluctance to make a link between the RMA and the WMD proliferation problem. Because they use, "conventional," indeed civilian technologies, the weapons systems associated with the RMA are for the most part considered, particularly by the United States and its allies, as outside any arms control regimes. Yet, one of the major concerns with the RMA is the possibility of an asymmetrical response by states or groups against whom RMA technologies are to be used. This in turn has contributed to efforts by the United States and its allies to deal with the WMD threat through multilateral arms control measures, such as the Non-Proliferation Treaty and unilateral counter-proliferation efforts. Amongst the latter is the retention by the United States and NATO of the threat of nuclear response in the event that WMDs are used against them. Thus the West now has a new reason not to fully abandon nuclear deterrence, fear of asymmetrical responses to the RMA.
6. Nevertheless, concern about WMD is very much on the international agenda and much has been done to establish new norms. In some areas of arms control, such as with regard to conventional forces in Europe, major progress has been made.
7. What this suggests is that, despite the RMA, existing efforts to control WMD can and should be pursued while acknowledging that the future international security environment is likely to be one where *both* the RMA and arms control will present competing, but not always mutually exclusive, claims for the enhancement of international strategic and political stability.

TABLE I: APPLICATION OF ARMS CONTROL METHODS AND SYSTEMS TO RMA WEAPONS AND TECHNOLOGIES

Methods

<i>General on-site inspection</i>	Providing for on-site inspection of the spread of RMA weapons and supporting technologies would require an unprecedented level of intrusion into the national military establishments, and related civilian industrial sectors. Moreover, to be applied fairly, it would require that the leading RMA states of the West, including the United States be prepared to subject themselves to this intrusion.
<i>Selective on-site inspection</i>	Even this would demand a level of intrusiveness on a continuing basis that would be hard for states to accept and for a regime to sustain.
<i>Challenge on-site inspection</i>	Given the nature of the weapons and the technologies it would be easy for the challenge state to hide capabilities that it should not have under a Treaty. Moreover, in view of the applicability of civilian technologies to the RMA it would be difficult to determine what infraction was to be challenged.
<i>Control Posts/Observation/ Liaison Missions</i>	Not applicable.
<i>Remote sensing in situ</i>	Not applicable.
<i>Remote sensing-National Technical Means</i>	To a certain extent this goes on as states try to monitor military progress in other states , but the difficulty of actually looking inside weapons from space makes this less applicable to the RMA than to the nuclear weapons of the Cold War era.
<i>Complaints/ Consultation</i>	Assuming a group of states agreed to place limits on some RMA weapons and technologies, a Treaty could provide for a mechanism of consultation if one party was seen as not following the agreement. Here too though, agreement on the validity of the complaint would be difficult in light the nature of RMA technologies and the rapid changes associated with it.

<p><i>Collateral Analysis</i></p>	<p>In the Cold War, with the asymmetry in the availability of open literature information between East and West, this was not a very reliable method of verification. But in the post-Cold War era with so much information publicly available, much of it produced by governments themselves, and globalization of the media, verifying some elements of the RMA could be easier, for example, military organization and doctrine. Moreover, once developed, the capabilities of weapons systems may become known, especially if they are employed.</p>
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Systems

<p><i>Photo Reconnaissance/ Satellite</i></p>	<p>Useful for observing some weapons developments, but limited in terms of providing for surveillance of technological changes based upon advanced computer techniques. Moreover, only some states would be able to employ these systems.</p>
<p><i>Radiation Detectors/ Seismic Sensors/ Remote Sensing posts</i></p>	<p>Not applicable.</p>
<p><i>Literature survey/ Exchange of information</i></p>	<p>Useful tools for collateral analysis as method of keeping track of RMA developments.</p>

Level of Verification

<p><i>Absolute Verification</i></p>	<p>Nearly impossible given the nature of the weapons and the technologies which make observation and counting difficult.</p>
<p><i>Adequate Verification</i></p>	<p>If the NPT is held up as a regime with “adequate verification”, efforts to control the RMA could not even reach this level.</p>

<i>Limited Verification</i>	There is some scope here because there is so much that is observable in the RMA and so much information in the public domain. This could be supplemented with NTM based upon satellite surveillance.
<i>Token Verification</i>	Given the difficulties of limited RMA-related technological developments and the reluctance to do so, a very vague agreement on limitations may be possible, in which case some token effort at reaching agreement on verification would accompany the agreement consistent with its lax character. The more intrusive methods would not be included.

TABLE II: WEAPONS AND VERIFICATION METHODOLOGY

----- Means Used to Verify System -----

Weapon Verified	<i>Treaty</i>	<i>Policy</i>	<i>NTM</i>	<i>OSI</i>
WMD	y	y	y	y
Biological	y	y	y	n/y*
Chemical	y	y	y	n/y*
Conventional	y	y	y	y
RMA-based technology	n [†]	n [†]	n [†]	n [†]

(where y = yes, n = no)

Notes:

* During the Cold War a treaty was ratified between the superpowers concerning biological weapons, though chemical agents were still stockpiled. Following the end of the Gulf War, the United Nations Special Commission (UNSCOM) conducted on-site inspections of potential biological and chemical weapons facilities in Iraq.

† To date there has been no formal arrangement to control or inspect RMA based technology. The RMA has not created a new weapon or system that could be easily subjected to traditional arms control verification, although there is much that is observable in the RMA. As the above table demonstrates however, regardless of RMA capability or not a state may still comply with or be subjected to the traditional methods of arms control verification. Arms that were subject to verification prior to the RMA are still verifiable by the same means, even though those systems may have been altered or advanced as a result of the RMA.

TABLE III: ALTERNATIVE STRATEGIC AND ARMS CONTROL SCENARIOS

	<i>RMA Effectiveness</i>	<i>Responses</i>	<i>Arms Control Implications</i>
State 1.	<ul style="list-style-type: none"> - tactically effective - potential longer conflict - concern about WMD response might deter military action - high levels of damage may raise moral issues 	<ul style="list-style-type: none"> - use RMA against the United States. - threaten or use WMD 	<ul style="list-style-type: none"> - provide justification for more development of RMAs - make efforts to control WMDs of the target state difficult - justify retention by the United States of nuclear weapons - justify extended deterrence to neighbouring countries - complicate verification efforts because of lack of trust and consensus - yet highlights the importance of continued efforts to control WMDs
State 2.	<ul style="list-style-type: none"> - tactically and strategically effective - less potential for longer conflict - use of RMA against WMD facilities 	<ul style="list-style-type: none"> - WMD response at a low threshold and therefore more problematic 	<ul style="list-style-type: none"> - potential for arms control given disunity of WMD options depending on the size of the conventional forces and political will - but reinforces benefits of RMA for the United States.
State 3.	<ul style="list-style-type: none"> - tactically and strategically effective under certain conditions - where weak conventional forces provide few targets RMA effectiveness is limited and potential for longer conflict 	<ul style="list-style-type: none"> - settlement due to lack of options - guerilla attacks - WMD used in terrorist-style attacks 	<ul style="list-style-type: none"> - political pressure to accept arms control possible - but dedication of government or factions may make this difficult - justifies acquisition of capabilities to disrupt RMA use

State 1. – significant conventional capability, significant WMD, and moderate RMA capability.

State 2. – moderate conventional capability and significant WMD capability.

State 3. – limited conventional and WMD capability

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