

**STRATEGY
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NATIONAL MISSILE DEFENSE — HAS THE TIME COME?

BY

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USAWC STRATEGY RESEARCH PROJECT

National Missile Defense - Has the Time Come?

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ABSTRACT

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This strategic research paper explores the question of whether the United States should field a National Missile Defense (NMD) system now. In short, has the time come to field such a system? The answer, presently, is no. The NMD issue is explored in four major aspects as follows: the threat, technology, costs, and the impact upon arms control regimes, particularly the ABM treaty.

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NATIONAL MISSILE DEFENSE - HAS THE TIME COME?

Today a debate rages over the issue of National Missile Defense (NMD). At stake is whether the United States will, in the near future, develop and field an NMD system. We do not have such a system now, and this fact seems to be lost on the public, "Most Americans cannot believe the United States is incapable of stopping even a single warhead launched at it. One recent nationwide poll found that an overwhelming 73 percent of Americans did not know that their government lacked the capability to defend against a ballistic missile strike launched on the United States."¹ Despite the fact that we do not have an NMD system and that the public seems to think we do, the real question is *should* we have such a system?

The short answer to the question, NMD - has the time come, is, I believe, no. This paper will discuss why I take that position. I will cover the NMD issue from several key aspects including the threat, technology, cost, and treaty implications. Then I will wrap up with a conclusion that reinforces my belief that the United States ought not pursue a policy of near term fielding of an NMD system.

The Threat

In order to assess properly whether or not an NMD system is needed, the first reasonable course of action is to determine what, if any, threat exists which would necessitate an NMD

response. A plethora of information exists relating to the threat requiring missile defenses in general and NMD in particular. Additionally, there is a trend for the threat to be portrayed as escalating. What there is not, despite much writing on the subject, is a precise definition of the exact nature of the ballistic missile threat facing the United States. At least there is not one that is agreed upon. In that environment we now have some congressmen pushing for immediate fielding of an NMD system, "(Congressman Floyd) Spence said the report, which contradicts CIA assessments that no imminent long-range missile threat exists, confirms his and many Republicans' beliefs that the Pentagon must move more quickly to develop a national missile defense system to protect U.S. cities."² Simultaneously our Defense Secretary is taking a slightly different approach, "A decision on whether to actually deploy a national missile defense will be made in June 2000...The decision will depend on two things...The level of threat of a missile attack...We are affirming that there is a threat, and the threat is growing, and that it will pose a danger not only to our troops overseas but also to Americans here at home."³ Congress, based on its view of the threat, seems to be pressing for immediate fielding of an NMD system while the Clinton Administration appears to be out of step with that view. So currently at the very highest levels there is no consensus on

the ballistic missile threat or what to do about the threat.

How did we get to this point?

Not long ago, in 1998, the NMD threat was depicted as virtually non-existent by Defense Secretary Cohen, "no country, other than the declared nuclear powers, will develop or otherwise acquire a ballistic missile in the next 15 years that could threaten the United States."⁴ This position was supported by earlier work in 1993 on the Bottom-Up Review where the Clinton Administration outlined a minimal approach to NMD, "Given the nature of the present and projected threat from ballistic and cruise missiles armed with weapons of mass destruction, a decision was made to emphasize protection of forward-deployed U.S. forces in the near term and to proceed with a more robust TMD program, combined with a more limited NMD technology program."⁵ Later in the 1997 Quadrennial Defense Review the NMD issue was referred to as, "a high national priority ... creating the option to make a decision on deployment as early as FY 2000, if the threat warrants."⁶ Thus it is clear that through most of the last eight years our official estimate on the ballistic missile threat facing the United States may be characterized by the use of the phrase, "if the threat exists".

The Clinton Administration therefore developed an NMD policy that became known as the "Three-Plus-Three" program. This program, largely threat based, adopted in February 1996,

"calls for the development of an NMD system that is capable of being deployed by 2003 if the ballistic missile threat makes it necessary."⁷ Some, including congress, have not been willing to go along with the Clinton Administration policy; yet, there is still the lack of concrete evidence that the threat dictates a different policy. Congress therefore, as part of the National Defense Authorization Act for Fiscal Year 1997, established a commission tasked to, "assess the nature and magnitude of the existing and emerging ballistic missile threat to the United States."⁸ The in depth 307-page classified report produced by this body has fueled the debate between congress and the administration over NMD. The membership and findings of the report are worth taking a further look at.

The chairman of the commission, The Honorable Donald H. Rumsfeld, is an individual of great credibility. He previously served as a naval aviator, member of congress, NATO ambassador, White House Chief of Staff, Secretary of Defense, and Presidential Envoy to the Middle East. The eight other members of this commission were of equally outstanding qualifications.

The commission met with over three hundred members of the United States intelligence community including personnel from the Central Intelligence Agency, National Reconnaissance Office, National Imagery and Mapping Agency, and the Office of Naval Intelligence. For six months, culminating in the July 1998

written report, the commission examined and assessed the ballistic missile threat posed to the 50 states. The Rumsfeld Commission report amounts to one of the best, if not the top assessment, of the ballistic missile threat facing the United States produced to date. What conclusions did the commission reach?

The key aspects of the Rumsfeld Commission's work may be summarized as follows:⁹

- "Ballistic missiles armed with WMD payloads pose a strategic threat to the United States. This is not a distant threat. Foreign assistance is pervasive, enabling and often the preferred path to ballistic missile and WMD capability.
- "A new strategic environment now gives emerging ballistic missile powers the capacity, through a combination of domestic development and foreign assistance, to acquire the means to strike the U.S. within about five years of a decision to acquire such a capability (10 years in the case of Iraq). During several of those years, the U.S. might not be aware that such a decision had been made.
- The threat is exacerbated by the ability of both existing and emerging ballistic missile powers to hide their activities from the U.S. and to deceive the U.S. about

the pace, scope, and direction of their development and proliferation programs.

- "Therefore, we unanimously recommend that U.S. analyses, practices, and policies that depend on expectations of extended warning of deployment be reviewed and, as appropriate, revised to reflect the reality of an environment where there may be little or no warning."

The Rumsfeld Commission report purposefully did not address policy issues. No recommendation was made to immediately deploy an NMD system. Nor was the ballistic missile threat to the United States defined as a present danger from countries other than those who have had that capability in the past. The commission's goal, which they seem to have achieved, was to spark discussion as indicated by the following statement within their own charter, "Debate and agreement on the appropriate responses to the ballistic missile threat are needed. The commission hopes that the assessment will be helpful in that regard."¹⁰

One of the first responses to the report, a business as usual comment, was issued by Defense Secretary Cohen on the same day that the report was released, "The administration and congress share a commitment to develop an effective national missile defense system to protect the United States against a limited attack from a rogue state. The Department of Defense is

currently working on a program that would enable the United States to deploy a limited national missile defense program in 2003, if necessary."¹¹ Others, particularly Republican legislators, have stepped up calls for immediate deployment of an NMD system since the release of the Rumsfeld report. Senator Jessie Helms was quoted recently, "If I have my way, the Senate this year will clear the way for the deployment of national missile defense."¹²

The National Intelligence Estimate 95-19 (NIE 95-19) of 1996 defined the emerging threats to North America during the next fifteen years as, "the United States is unlikely to face an indigenously developed and tested intercontinental ballistic missile threat from the Third World before 2010, even taking into account the acquisition of foreign hardware and technical assistance."¹³ The Rumsfeld Commission report of 1998 challenges some of the supporting pillars of NIE 95-19 without directly confronting the idea of when we might face such a threat other than suggesting that the threat may emerge earlier. Moreover the Rumsfeld report, while not making the case for immediate fielding of an NMD system, does a great job pointing out that we should move now to place additional resources in the vital area of intelligence. The report makes it very clear that our intelligence capabilities fall well below where they need to be. The shortcomings in our intelligence gathering capabilities,

particularly in the area of gauging the ballistic missile threat, are an area we ought to fix regardless of whether or not we field an NMD system anytime soon.

The Rumsfeld report places great emphasis on what the commission considered the key roles played by foreign assistance and technology transfer. Both of these have significant potential to speed up the acquisition of ballistic missile capability by Third World countries. These areas, combined with a less than fully capable intelligence architecture, are not strong points in the U.S. policy for countering the ballistic missile threat.

In the end though, despite the intelligence estimates and commissions, we are left with a dilemma. If one accepts that the threat is presently represented by the remote possibility of an accidental launch by a nation such as Russia and that at some point in the near future we will face the prospect, perhaps without warning, of a Third World threat, then what do we do about it?

Few people seem willing to continue active support of the Clinton Administration three-plus-three program. This program may be summarized as follows, "Develop by 2000 the elements of an NMD system that could be deployed within three years to protect the United States against a limited 'rogue' nation ballistic missile attack as well as an accidental or

unauthorized launch from more nuclear-capable states. If a missile threat exists in 2000, the United States will then decide whether to deploy the system by 2003. If no threat exists in 2000, then the United States will continue NMD development and maintain the capability to deploy the system within three years of an identified threat."¹⁴ As mentioned earlier several legislators are pushing for a far different approach than the Clinton Administration.

A number of people are not anxious to embrace the Republican idea of a race to field an NMD system as evidenced by David Isenberg's comments in his response to the Rumsfeld report, "Predictably, the usual right-wing suspects - The Heritage Foundation, The Center for Security Policy, Reps. Curt Weldon (R-Pa) and Floyd Spence (R-SC), SEN. Thad Cochran (R-MS), etc., proclaimed the report as proof that America was vulnerable and defenseless and facing a huge threat, perhaps the biggest since disco was popular."¹⁵ Both sides, the administration and congress, have failed to make their case with regards to the need for an NMD system. This is mainly due, I believe, to their mutual failure to define the threat in concrete terms.

In sum the current threat does not clearly dictate the fielding of an NMD system now; however, the threat may soon approach the point that will require some action on our part. Whether we decide to field an NMD system now or at some point in

the future depends on factors besides the threat, "Any decision to deploy a National Missile Defense System should rest on a broader set of considerations than those outlined in the Rumsfeld Commission Report. These considerations should address the effectiveness of an NMD system. Simply put: Are we capable, either now or in the near-term future, of deploying an effective NMD against small numbers of ballistic missiles? The evidence, at present, seems mixed at best."¹⁶ This brings us to the issue of technology.

Technology

As indicated by the latest quote above, the technological challenges of fielding a capable NMD system have been difficult to solve. The Defense Secretary, William S. Cohen, recognized technology along with the threat as the two things upon which the decision whether to field an NMD system depended upon in his statement, "The decision will depend on...the level of threat of a missile attack and the Defense Department's technical readiness to build such a defense."¹⁷

The Army's Theater High Altitude Air Defense System (THAAD) represents a classic case of technological problems that must be solved prior to fielding an NMD system. Despite the commitment of millions of dollars, the THAAD system has experienced a steady stream of testing failures to the point where congress has recently questioned the wisdom of continued

funding for that system.¹⁸ In short, THAAD has not demonstrated that it can successfully engage an incoming ballistic missile. Nor has any other system.

Even more recently in yet another sign of the problems with THAAD and technological difficulties with similar systems, the Pentagon has announced a new plan to merge THAAD development with Navy Theaterwide so that, "both the Army and Navy missiles would continue testing until one emerges as the better system."¹⁹ The technological problems are compounded when one considers the issue goes far beyond a single weapon system such as THAAD or Navy Theaterwide. Any NMD system fielded would have to be capable of integrating with a complex array of sensors, weapons platforms, C4I systems, and be capable of operating in a joint/combined environment. Such a system would also need to be fitted with the potential to add improvements as technology continues to advance.

Congress, despite the current demonstrated technological shortfalls, is pushing for an early deployment of an NMD system. Both Senators Richard Lugar (R-IN) and Trent Lott (R-MS) have introduced legislation aimed at actual deployment of an operational NMD system by the end of 2003.²⁰ This approach, however well intentioned, makes little sense given such a system does not currently exist, and indications are that development of such a system will take years, "Both the technical and

scheduling risks associated with the administration's 3 + 3 approach and the *deploy now* approach seem high. The average time for moving a program from development to its initial operating capability is 9.9 years, considerably more than the six envisioned by the administration. With respect to NMD, which would rely on integration of a complex array of systems, even average times appear insufficient."²¹

The immediate deployment approach, even if we could solve the technological issues, could actually be the wrong move strategically. Fielding an NMD system now would, to a great extent, lock us into today's technology while, "Several of the technologies that are progressing most rapidly (e.g. those relating to sensors, managing huge databases, networking myriad defense systems) are also those that would play a large role in determining the effectiveness of an NMD system."²² This approach may allow potential adversaries to counter our defenses as the strengths and weaknesses of our defenses would be known before they finalized their ballistic missile programs.

In the end we are again left with the question of what to do about this situation which is characterized by an uncertain threat against which we do not have a defense that works. Fielding an NMD system now or in the near future makes no sense from the technological perspective.

During the era of the monolithic Soviet threat our military forces were organized, trained, and equipped to counter that specific threat. Since the demise of the Soviet Union, our focus has shifted from a threat-based to a capabilities-based force, "the U.S. military must be a capabilities-based force that gives national leaders a range of viable options for war."²³ A capabilities-based force has the potential to become prohibitively expensive in the situation where leaders tend to never meet a capability they can manage to refuse. This brings us to the third aspect of determining whether the time has arrived to field an NMD system - cost.

The Cost

Despite Defense Secretary Cohen's recent remarks indicating that the threat and technology considerations would drive the decision whether to field an NMD system, cost is clearly a big factor in the equation. The push to combine THAADs and Navy Theaterwide, in addition to facilitating increased technological benefits, is being made, "as a way to reduce costs."²⁴ Fielding an NMD system would cost a considerable amount of money. According to the Quadrennial Defense Review, the development funding alone for NMD would be \$2 billion.²⁵ The entire FY 98 procurement budget was \$42.6 billion; therefore, the potential addition of NMD would represent a significant amount of dollars as well as signal, in an era of fairly austere defense budgets,

that some other program or programs may have to be sacrificed in order to buy an NMD system.

The total FY 99 defense budget is \$270.6 billion. This represents 3.1% of the gross domestic product of the United States. Defense spending in 1986 during the peak of the Reagan buildup reached 6.2% of gross domestic product. The Joint Chiefs have recently told congress the services will need another \$17.5 billion to fix short-term modernization.²⁶ NMD, even when viewed within the overall defense budget, is a big-ticket item that will not be easily paid for. Moreover the recent federal government projected budget *surpluses* may make it possible to add funding to defense; however, "competing priorities such as cutting taxes and protecting Social Security make a substantial rise in defense spending unlikely...supporting the badly needed acceleration of research, development, testing, and evaluation of NMD-related technologies, systems and architectures will likely find the Pentagon confronted with difficult tradeoffs between RDT&E, readiness, and modernization."²⁷ In a nutshell the benefits of additional spending on NMD would have to be weighed against the costs to other military capabilities.

On the other hand, assuming that we are able to put adequate funds into NMD without significantly degrading other programs, there is still the question of what the extra money

can actually do. Some say the NMD program is simply a waste, "Critics of the National Missile Defense system - more limited than President Reagan's ambitious *Star Wars* failure - say \$50 billion has been wasted so far on a plan that may never work because of how difficult - if not impossible - it is to shoot a missile out of the sky."²⁸ Additionally, spending more money may not lead to solving the technological problems, "there is a limit to what money can do to accelerate the missile defense effort."²⁹ Much like finding a cure for cancer, money alone is not the answer. There is still the need for research and testing which takes time in addition to money. Finally, like the cancer scenario, there is no guarantee we will succeed in fixing the challenges associated with NMD despite whatever sum of money we commit to the effort.

National Missile Defense is poised, despite numerous uncertainties, to receive a boost in funding. Citing the growing threat to the United States troops overseas and Americans at home, Defense Secretary Cohen recently stated, "he is ready to ask Congress for \$10.5 billion to build a National missile defense system by 2005."³⁰ That amount translates to three times the sum currently programmed for NMD during the same period, and the money will be requested with the acknowledgement that, "Cohen conceded Jan 20 that despite tens of billions of dollars already spent and nearly two decades of research, the

United States does not yet know whether it can build a missile defense system that will work."³¹

All this money will be spent to counter the threat that, "a rogue nation with a handful of long-range missiles will launch a few at the United States."³² Meanwhile we risk alienating countries such as Russia, who still posses over 6,000 operational warheads, and China who has a fewer number of such missiles. What do we do about those countries? What do we do about the Anti-Ballistic Missile (ABM) treaty? A fielded NMD system would most likely represent a violation of the ABM treaty. Is this the best course of action for the United States?

The ABM Treaty

Two cornerstone aspects of deterring missile attack on the United States up to this point have been our massive retaliatory capability and the ABM treaty. Both of these pieces are still in effect, and, if anything, our retaliatory abilities surpass any other country now more than ever. Even the most rogue nation led by the worst possible leader must give serious consideration to the consequences of launching a ballistic missile at the United States. Clearly we are not about to abandon our ability to retaliate; however, there are signs that we may be willing to withdraw from the ABM treaty.

There is much debate concerning whether or not abandoning the 1972 era ABM treaty, particularly for the sake of a limited NMD capability, is a good idea. The chief U.S. negotiator of the ABM treaty, Gerald C. Smith, wrote in 1998 that, "the treaty prevented what might have been a ferociously expensive and dangerously destabilizing competition between offense and defense...the real way to reduce the nuclear threat is not to seed space with hundreds of weapons, or ring our nation with radar and rockets. Rather, it is to employ the nonproliferation regime and sharply reduce the nuclear arsenal left over from the Cold War competition - a task for which continuance of the ABM treaty will be essential."³³ Just what does the ABM treaty provide for the United States and why might we want to modify or scrap it?

The ABM treaty, an arms control agreement between the former Soviet Union and the United States, was signed on May 26, 1972 after nearly two-and-a-half years of negotiations. The treaty was amended by a 1974 Protocol that reduced from two to one the number of permitted 100-interceptor ABM sites. The Soviet Union maintained such a site around Moscow while the United States, "abandoned its Grand Forks, North Dakota, site in 1975 because it was judged that the protection provided by its 100 interceptors to the adjacent missile field was not worth the cost of maintaining the system."³⁴ Other key provisions of the

treaty include the complete banning of the development, testing, and deployment of all sea-based, air-based, space-based, and mobile land-based ABM systems.

The development and testing of multiple-warhead or rapidly reloading ABMs is also banned in order to limit the firepower of the 100-interceptor ABM site. New technology systems such as lasers and particle beams may be developed and tested in only the fixed land-based mode, but these systems could not be deployed without amending the treaty. Finally, in what may be the last significant aspect of the treaty, the fielding of dual capable systems is addressed by, "also prohibited giving non-ABM systems and components (e.g. air defense missiles or anti-satellite weapons) an ABM capability, or testing them in the ABM mode."³⁵ The definition of what constituted ABM mode and the problem of defining the dividing line between defenses against long-range strategic ballistic missiles, which are subject to the ABM treaty restrictions, and defenses against shorter-range missiles, which are not, constitute issues that the Clinton Administration has recently attempted to resolve through the Standard Consultative Commission (SCC). The SCC is a bilateral forum established as part of the original treaty.

The ABM treaty has the aim to, "curtail the missile defenses of both sides in order to leave them vulnerable to retaliatory nuclear strikes which would thus ensure and codify

the strategic mutual assured destruction (MAD) capability...in the early 1970s, huge ABM systems were believed to be unable to defend, in an effective manner, against a massive first strike but these could provide significant protection against a weakened retaliatory strike. This would tip the balance in favor of a pre-emptive strike. Also, missile defenses were believed to encourage a destabilizing offensive-defensive arms race and jeopardize nuclear arms reduction agreements."³⁶

The ABM treaty, which essentially prohibits the deployment of an NMD system, does provide security to the United States; especially in regards to those stable nations that characterized the Cold War era. Therefore any attempt to change or eliminate the ABM treaty should be approached cautiously. Fielding an NMD system could, "lead a state that fears its missiles may be blocked to the further fear that the blocking party - that's us - may be building a shield behind which to plan an aggressive policy or even a first strike."³⁷

A number of nations, including Russia and China, have recently expressed displeasure over our NMD program. Colonel General Leonid Ivashov, chief of international cooperation at the Russian Defense Ministry, recently stated that, "Any changes to the ABM treaty would be regarded as a threat to Russian security interests."³⁸ Furthermore Russia has threatened to withhold ratification action on other arms reduction related

treaties such as START II, "attempts to bypass the ABM treaty would upset strategic stability in the world and may jeopardize long-standing ratification of the START II arms reduction treaty by the Russian parliament."³⁹ China has voiced reservations concerning NMD technology as it relates to Taiwan which China considers a renegade province, "Including Taiwan in any form of the TMD system would constitute a violation of international law."⁴⁰

The Clinton Administration now seems intent on moving ahead with an NMD system even if it violates the ABM treaty as evidenced by Defense Secretary Cohen's remarks, "the administration would pursue the program (NMD), an heir to Ronald Reagan's Star Wars proposals, even if Russia were to charge that it violates the 1972 Anti-Ballistic Missile Treaty signed by the United States."⁴¹ These sorts of statements are bound to make it more difficult for us to deal with Russia in the future. Additionally, the implication is that the benefits of fielding an NMD system outweigh the advantages of the ABM treaty.

In sum the ABM treaty appears to have served us well; however, at the same time the Cold War is over. The environment we live in today is far different than that which existed in 1972, "When that treaty was signed no one envisioned that countries such as North Korea or Iran would develop intercontinental ballistic missiles and the ability to arm them

with nuclear or chemical warheads."⁴² The future may become even more complex if nations such as North Korea actually do develop ballistic missiles capable to striking the United States.

However, the present situation requires that we act responsibly towards countries like Russia and China who can strike us now rather than at some point in the future.

It is not entirely clear what course of action the United States should pursue with regards to the ABM treaty, "To the extent they prove attractive, certain defense options that fall outside the parameters of the ABM treaty and other arms control agreements may offer grounds for reevaluating the benefits of such agreements. This will be particularly true if these NMD options offer the benefit of far more effective active missile defenses than treaty-constrained alternatives. On the other hand it is not clear at present that the benefits of deploying a non-compliant NMD system of limited effectiveness would outweigh the benefits of withdrawing from the ABM treaty."⁴³ Given other previously discussed problems associated with NMD, it makes little sense to abandon the ABM treaty at this point in order to field an NMD system.

Conclusion

The time has not come to field an NMD system. Much has been made of the threat. Clearly there are signs that the threat is on the horizon; however, what is not clear is that the

threat warrants the fielding of an NMD system. The current fact is that we, because of technological problems, do not have the capability to field a reliable NMD system. The costs of an NMD system measured by billions of dollars should force us to take a very close look at the actual need for such a system before we commit ourselves. Part of that look ought to include alternative strategies because right now it appears that there are none being seriously considered. Finally, we must place appropriate emphasis on arms control initiatives as part of our overall strategy. Withdrawing from the ABM treaty at this point would seem unwise.

While now is not the time to field an NMD system, it is time to undertake, at the national level, a serious debate on the issue, "we need a prompt, comprehensive assessment of the dangers to the American homeland - both in the near term and the long term - and strategic options for meeting them. Such an assessment should take into account a range of potential threats and corresponding strategic options, and examine both the promise and limits of technology. It should also include the opportunity cost involved. Finally, it should incorporate the full range of military, political, and diplomatic instruments, to include the prospective benefits, and drawbacks, of arms control and technology transfer regimes. Given the high stakes

involved in terms of our security, and the costs inherent in NMD deployment, it is an assessment well worth undertaking."⁴⁴

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³⁷Stephen S. Rosenfeld, "Missile Defense, Strategic Offense," 12 February 1999; available from <http://www.washingtonpost.com/wp-srv/Wplate/1999-02/120421-021299-idx.html>; Internet; accessed 14 February 1999.

³⁸Moscow Associated Press. "US missile proposal irks Russia," Carlisle (PA) Sentinel, 22 January 1999, sec. A, p. 7.

³⁹Ibid.

⁴⁰Toni Marshall, "China warns U.S. not to include Taiwan in missile defense," 12 February 1999; available from <http://www.washtimes.com/internatl/internatl1.html>; Internet; accessed 14 February 1999.

⁴¹Dana Priest, "Cohen Says U.S. Will Build Missile Defense," 21 January 1999; available from <http://www.washingtonpost.com/wp-srv/Wplate/1999-01/21/2531-012199-idx.html>; Internet; accessed 14 February 1999.

⁴²Thomas W. Lippman, "New Missile Defense Plan Ignites Post-Cold War Arms Debate," 14 February 1999; available from <http://www.washingtonpost.com/wp-srv/Wplate/1999-02/14/0321-021499-idx.html>; Internet; accessed 14 February 1999.

⁴³Andrew F. Krepinevich, "The Rumsfeld Commission Report, Where do we go from Here," 4 August 1998; available from <http://www.csbahome.com>; Internet; accessed 2 February 1999.

⁴⁴Ibid.

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