To Be or Not to Be: The Ongoing Question of Missile Defense

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Abstract

This paper discusses U.S. development of Ballistic Missile Defense (BMD) capabilities, particularly to protect U.S. forces and allies from the intensifying North Korean threat. The first section provides a brief history of the debates surrounding BMD's development, as well as the regional security context in Northeast Asia. The second highlights current developments and trends in BMD, including the shift toward missile defense (MD) *tout court*. The paper concludes with specific recommendations to improve MD organization and management to protect U.S. interests in a rapidly advancing missile threat environment: The Missile Defense Agency's budget must be increased and its focus returned to research and development (R&D). The responsibility for procurement and operations and management must be shifted to the Services, and MD should be designated as a Major Force Program (MFP) to protect money designated for it in the Services from being redirected. The Joint Integrated Air and Missile Defense Organization should be empowered to take a leading role in the current Missile Defense Review and in continuing to plan, coordinate, and oversee MD development. Finally, the Secretary of Defense should appoint a Special Assistant for Missile Defense to ensure the continued prioritization of MD.

Ballistic missile defense (BMD) has been a controversial topic since the dawn of the missile age in WWII. Only high technology is able to counter the missile threat, and advocates and detractors have recurrently disputed over possibilities and feasibility, with BMD efforts ebbing and flowing as a result. Meanwhile, the threat has only grown—North Korea is a case in point. While current U.S. BMD does provide protection from some attacks, it will take a concerted, sustained effort to mature the system and keep pace with expanding threats.

This paper discusses U.S. development of BMD capabilities, particularly to protect U.S. forces and allies from the intensifying North Korean threat. The first section provides a brief history of the debates surrounding BMD's development, as well as the regional security context in Northeast Asia. The second highlights current developments and trends in BMD, including the shift toward missile defense (MD) *tout court*. The paper concludes with specific recommendations to improve MD organization and management to protect U.S. interests in a rapidly advancing missile threat environment.

Background and Context

Strategic Restraint: Choosing Who and What to Counter

Since the 1960s, the history of BMD has been defined by debates over strategic restraint and threat focus. Not long after the Cuban Missile Crisis, intelligence reports suggested that the Soviet Union was developing an Anti-Ballistic Missile (ABM) capability that could be operational by 1966.[1] Some military and congressional leaders called for the rapid deployment of the Army's Nike-X ABM system in response, but President Johnson and Secretary of Defense McNamara opposed such a move for fear that it would stimulate an expensive arms race. The cost effectiveness and technical feasibility of the system were also in question. These three arguments have been the basis for the case against BMD ever since. Thus, Nike-X was only deployed a few years later and on a restricted scale, as a defense against a limited Chinese—not Soviet—attack.[2]

By 1968, the system (now called "Sentinel") shifted again, moving away from "thin" urban defense to "thick" defense of land-based intercontinental ballistic missiles (ICBMs).[3] Sentinel strengthened the U.S. deterrent against a Soviet first-strike by increasing the survivability of the nuclear force, making it a valuable bargaining chip in upcoming arms control negotiations.[4] When President Nixon took office, he emphasized this new mission by renaming the project "Safeguard" and planning up to twelve deployment sites, conditional on Soviet arms control cooperation.[5]

In 1972, the Strategic Arms Limitation Talks produced the Anti-Ballistic Missile Defense Treaty (ABMT), officially precluding both the U.S. and the U.S.S.R. from deploying strategic space-based, sea-based, or mobile BMD systems.[6] At first, each side was allowed two fixed missile defense sites, but a 1974 protocol reduced it to just one site and up to 100 interceptors.

[1] Dabrowski, *Missile Defense: The First Seventy Years*, 9.
[2] Ibid.
[3] Ibid., 10.
[4] Ibid.
[5] Ibid., 11.
[6] U.S. Department of State, "Treaty between the US and USSR," May 26, 1972.

Having served its political purpose, Safeguard was terminated in 1976; even the one authorized site in Grand Forks, North Dakota was closed for technical reasons.[7]

In the background, however, research on BMD continued. Because heated political disagreements over nuclear-armed interceptors threatened to further paralyze BMD projects, by the early 1980s, the Army was increasing its efforts to develop hit-to-kill interceptors and the Defense Advanced Research Projects Agency (DARPA) was exploring the BMD potential of directed energy.[8] These initial technological forays laid the foundation for BMD options still debated today.

A change in administration and a convergence of personalities swung the pendulum back away from strategic restraint in the 1980s. Recognizing a growing vulnerability to a Soviet first-strike, the Joint Chiefs of Staff recommended unanimously to President Reagan in 1983 to begin developing strategic defenses.[9] Already predisposed to strategic defenses, Reagan was further influenced by several prominent missile defense advocates, such as Edward Teller—who was not known as a proponent of strategic restraint.[10] On March 23, 1983, Reagan made a televised speech announcing the beginning of a two-year program to determine the technical feasibility of missile defenses. The Department of Defense (DoD) created the Strategic Defense Initiative Organization (SDIO) which, in 1987, proposed a system composed of two space-based sensors, a ground-based sensor, a space-based interceptor, a ground-based interceptor, and a battle management system, collectively called the Strategic Defense Initiative (SDI) Phase I Architecture.[11] Full deployment of this system would have required withdrawing from the ABMT, adding to the controversy surrounding it.

The final debate was postponed, however, as the system was overtaken by events. With the end of the Cold War in sight, a review of the SDI program recommended transitioning the program into limited defense of the homeland and principal defense of deployed forces.[12] President George H. W. Bush made several changes accordingly, and theater missile defense became a main component of the new program.

This trend continued under President Clinton, partly because of the changing threat environment, and partly because the Administration emphasized adherence to the ABMT.[13] The pendulum was moving away once more, so theater missile defense was the main outlet for BMD R&D. In 1993, Secretary of Defense Les Aspin announced that the SDIO would be renamed the Ballistic Missile Defense Organization (BMDO) to reflect this change and signal the end of the SDI decade.[14] The five-year funding for BMD was slashed from $39 billion to $17 billion, requiring major restructuring of the BMDO.[15] Despite these pressures, it was during this time period that the BMDO began work on the familiar theater missile defense systems of today: PAC-3 (upgrading the Army's Phased Array Tracking Radar to Intercept on Target [PATRIOT] system), Aegis (adapting the air defense system to also counter ballistic missiles), Terminal High

[7] Dabrowski, *Missile Defense: The First Seventy Years*, 11.
[8] Ibid., 12.
[9] Hoffman, *The Dead Hand,* 52.
[10] Ibid., 50.
[11] Dabrowski, *Missile Defense: The First Seventy Years*, 13.
[12] Ibid., 14.
[13] Cooper, "Active Defenses to Help Counter Proliferation," 193-215.
[14] Baucom, *Ballistic Missile Defense: A Brief History*, May 2000.
[15] Ibid.

Altitude Area Defense (THAAD), and the Air-Borne Laser.[16] Another positive initiative of the time was the creation of the Joint Theater Air and Missile Defense Organization (JTAMDO) by Secretary William Perry in 1997. Under the Joint Chiefs of Staff, JTAMDO was intended to manage multi-service interests in missile defense (MD) and was responsible for coordinating joint mission capabilities with the Combatant Commanders.[17]

In 1996, the now Republican-controlled Congress pushed back against strategic restraint, and theater missile defense was overshadowed by "national missile defense."[18] Congress pushed the DoD to prepare a deployable system, and in 1999 passed the "National Missile Defense Act," decreeing that it was "the policy of the United States to deploy as soon as is technologically possible an effective National Missile Defense system capable of defending the territory of the United States against limited ballistic missile attack (whether accidental, unauthorized, or deliberate)."[19] Spurred on by an increasing threat from rogue states such as North Korea (discussed below), momentum was building to withdraw from the ABMT.

In December 2001, President George W. Bush gave Russia notice of the U.S.'s intention to pull out of the treaty, and the BMDO was renamed again; it is now known as the Missile Defense Agency (MDA). The MDA was charged to develop "a concept for an integrated, layered defense that would be capable of attacking warheads and missiles in all phases of their flight—boost, midcourse, and terminal—and was expected to eventually provide global defenses against missiles of all ranges."[20] In December 2002, the DoD announced that it would seek to field initial capabilities in 2004.[21] Under President Bush, the MDA and JTAMDO received sustained high levels of funding.[22]

The Threat Environment—North Korea

Since the end of the Cold War, BMD efforts—both regional and national—have been focused largely on the threat of rogue actors such as Iraq, Iran, and North Korea (DPRK). Although the 1995 National Intelligence Estimate predicted that a missile threat to the homeland would not appear for 15 years, Republican lawmakers accused it of strong political bias (pro-AMDT) and ordered their own study.[23] The resultant Rumsfield Commission was more dire, claiming that adversaries could develop missile capabilities within five years of deciding to do so. Coincidentally, North Korea tested the Taepodong-1 missile just over a month later, demonstrating important ICBM-related capabilities such as staging.[24]

Since then, the situation has only worsened. By 2002, President Bush had labeled North Korea a part of the "axis of evil," to which the DPRK responded with the usual threats.[25] In 2003, the DPRK withdrew from the Nuclear Nonproliferation Treaty (as it had long threatened to do and which it was in violation of anyway), conducting underground nuclear tests in 2006,

[16] Dabrowski, *Missile Defense: The First Seventy Years*, 15.
[17] Neuenfeldt, *Joint Theater Missile Defense Interoperability,* 7.
[18] Dabrowski, *Missile Defense: The First Seventy Years*, 15.
[19] Ibid.
[20] Ibid.
[21] Ibid., 16.
[22] Karako, *The Color of Money*.
[23] Baucom, *Ballistic Missile Defense: A Brief History*, May 2000.
[24] Ibid.
[25] Berger, Horitski, and Romero, *The North Korean Missile Threat*, 2.

2009, 2013, and 2016.[26] On September 3, 2017, North Korea conducted its sixth—and largest—underground nuclear detonation, which it claims was a thermonuclear weapon.[27] Some experts now believe North Korea could have between 20 and 25 nuclear warheads, and may be able to properly miniaturize them for an ICBM delivery.[28]

North Korea's missile arsenal is also discouraging. As part of the communist bloc, the DPRK has long benefited from Soviet and Chinese assistance in missile technology and has had an endogenous program since the 1960s. In terms of ICBMs, the DPRK successfully put satellites into orbit in 2012 and 2016 with a Taepodong-2 missile.[29] Five tests over the summer of 2017 demonstrated two new missiles: the Hwasong-12 (up to 4,500 km) and the Hwasong-14 (8,000-10,000 km).[30] Intermediate-range ballistic missiles (IRBMs) and medium-range ballistic missiles (MRBMs) also form part of the arsenal, totaling perhaps 50 intermediate-range (two variants) and 200 medium-range missiles.[31] The full operability, accuracy, and effectiveness of these weapons is doubtful, but combined with some 600 short-range Scud variants, the threat to South Korea and Japan cannot be underestimated, especially if equipped with nuclear payloads.[32] The threat to the United States is growing as the newest missiles enter the stockpile.

North Korea's actions are indicative of the changing global threat environment. On the one hand, its large arsenal of short- to intermediate-range missiles poses a real threat to U.S. forces and allies in the Pacific. On the other, it has a nascent capability to hit the U.S. homeland with a nuclear weapon. As time goes on, its capabilities are only progressing. Yet this threat is not limited to North Korea—missile technology is proliferating around the globe, potentially enabling a much broader array of adversaries (including non-state actors) to strike at the United States. Meanwhile, traditional missile adversaries such as Russia and China are also exploring next-generation missile technologies such as hypersonic glide vehicles.[33] The era of fewer, less capable threats is fading fast.[34]

Current Developments, Future Trajectory

Broadened Response

As a direct result of this changing threat environment, in 2008, the Joint Requirements Oversight Council approved a change in the Joint Theater Air and Missile Defense Organization's charter, and the organization became the JIAMDO—replacing the word "Theater" with "Integrated."[35] In 2010, Rear Admiral Archer Macy, former director of JIAMDO, said:

[26] Ibid., 1.
[27] "North Korea's missile and nuclear programme," September 15, 2017.
[28] Warrick, Nakashima, and Fifield, "North Korea now making missile-ready nuclear weapons," August 8, 2017.
[29] Berger, Horitski, and Romero, *The North Korean Missile Threat*, 3.
[30] "North Korea's missile and nuclear programme," September 15, 2017.
[31] Berger, Horitski, and Romero, *The North Korean Missile Threat*, 4.
[32] Ibid.
[33] Speier et al., *Hypersonic Missile Nonproliferation,* 2017.
[34] Weiss, "Seeing 2020," 104-112, 105.
[35] Liang, "Pentagon Beginning New Missile Defense Capability Study."

> The theater ballistic missile threat is evolving and one of its principal characteristics is increasing range, which enables a threat country to attack targets thousands of miles away. This attack could be crossing through one or more combatant commanders' area of operations or theaters, which has made the term "theater" missile defense obsolete.[36] The change in name therefore reflected DoD's desired shift to address longer-range ballistic missile threats.[37]

While the word "theater" faded perhaps from view, the term "regional" did not. Indeed, also in 2010, Robert Gates clearly states in the opening statement in the Ballistic Missile Defense Review (BMDR) that, "I have made defending against near-term regional threats a top priority of our missile defense plans, programs, and capabilities."[38] At the same time, it is important to "sustain and enhance the U.S. military's ability to defend the homeland against attack by a small number of long-range ballistic missiles."[39] "Integrated," then, refers to systems and capabilities, while "regional" and "homeland" refer to missions. The growing DoD ideal for missile defense is to have a large, interconnected system that is able to protect both regionally deployed forces and the homeland.

This idea gained further momentum in a 2013 Joint Chiefs of Staff publication, *Joint Integrated Air and Missile Defense: Vision 2020*. As denoted by the word "vision," this document outlines the Joint Chiefs' aspirations for MD by 2020. As discussed below, the capabilities it describes are still merely aspirational, but they do indicate MD's potential trajectory. "Integration" is again the word that sums up this trend. *Vision 2020* calls for a recognition of the "expanded [global] battlespace," and states categorically that "IAMD [integrated air and missile defense] forces will be expected to be able to plan and allocate forces for a specific theater with the awareness that adjustments may be required to accommodate Regional, Trans-Regional, and Homeland operations."[40]

Integrated defense also implies an expansion of the types of missiles threatening U.S. forces; hence the important "Air and" included in both JIAMDO's charter and *Vision 2020*. The DoD and the greater security community are recognizing that the proliferation of cruise missiles and development of hypersonic glide vehicles make "Ballistic" MD only a partial response. This is clearly reflected in the December 23, 2016 defense authorization act's requirement for a Missile Defeat Review (MDR). The change to "missile defeat" is a major break from the 2010 review, which was clearly limited to ballistic missiles. The FY 2017 National Defense Authorization Act stipulates that the review examine "the integration of offensive and defensive forces for the defeat of ballistic missiles, including against weapons initially deployed on ballistic missiles, such as hypersonic glide vehicles; and [the] cruise missile defense of the homeland."[41]

Noticeable too is the substitution of the word "defeat." There is a growing recognition that missile defense can only be one part of a larger strategy. "Defense dominance" against missiles is not operationally, technologically, or fiscally viable and is not the stated goal of MD.[42]

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[36] Ibid.
[37] Ibid.
[38] Department of Defense, *Ballistic Missile Defense Review*, i.
[39] Ibid.
[40] Joint Chiefs of Staff, *Joint Integrated Air and Missile Defense*, 2.
[41] Karako, *Missile Defense and Defeat*, 80.
[42] Ibid., 42.

The MDR is thus required to review "left- and right-of-launch ballistic missile defense for both regional and homeland purposes and the full range of active, passive, kinetic, and nonkinetic defense measures across the full spectrum of land-, air-, sea-, and space-based platforms."[43] In contrast, the 2010 BMDR requirements do not have even the slightest allusion to such a broad strategy.[44]

Next-Generation Technologies

Current trends in MD are clearly toward a "seamless battlespace," a broader threat definition, and a greater array of counter-missile capabilities. This is reflected not only in the statements and documents of MD leaders but also in the technologies currently under development or debate within the MDA. Several notable examples are described below.

Space-based precision tracking: Current space sensors detect missile launches, calculate approximate impact points, and forward the information to ground-based radars for missile tracking. Space-based tracking systems could follow missiles from "birth to death," better distinguish between real warheads and decoys, and "significantly expand the operating and defended areas of regional defenses."[45] Such systems could also contribute to tracking more advanced threats, such as maneuvering hypersonics. In 2009, the MDA launched two Space Tracking and Surveillance System demonstration satellites that produced excellent results, validating the feasibility of the concept.[46]

Space-based kill layer: The idea of a space-based kill layer has been debated since Reagan's Strategic Defense Initiative. Though insufficient by itself, fielding space-based interceptors or even, eventually, space-based lasers will significantly augment regional and homeland defenses. Like space-based tracking, a space-based kill layer offers the most potential for countering a broad array of missile threats. Though this is a future capability, the development of a space test bed is on the table to begin work on the necessary technologies.[47]

Multi-Object Kill Vehicle: The ability to kill multiple missiles, warheads, or decoys with a single booster is compelling enough that the MDA reopened the project after it had been canceled for budgetary reasons in 2009.[48] The current contract was awarded to Raytheon in 2015.[49] The intent is for the vehicle to fit within existing interceptors, allowing the force to be upgraded without being entirely replaced. The multi-object kill vehicle is a response to adversary advances in missile technology.

Directed energy: Like all of the above concepts, directed energy weapons have been grounds for a heated debate over cost, effectiveness, and potential. Detractors point to high costs and far-from-mature development, as exemplified by the Air-Borne Laser (ABL) program in the 2000s. Initial plans scheduled the first ABL lethality test for 2005; it did not occur until 2010 and incurred approximately $1 billion in overruns.[50] Although eventually re-designated as a "test bed," it did demonstrate the viability of lasers for MD when it passed tests to acquire and track

[43] Ibid., 80.
[44] National Defense Authorization Act for Fiscal Year 2009, Public Law 110-417, 110th Cong., §§ 234.
[45] Karako, *Missile Defense and Defeat*, 49.
[46] Ibid.
[47] Ibid., 51-52.
[48] Missile Defense Advocacy Alliance, "Multi-Object Kill Vehicle."
[49] Raytheon, "Kill Vehicles."
[50] "ABL: Lowered Expectations," 30.

a boosting missile, accommodate for atmospheric conditions, and place lethal energy on it.[51] The system was retired in 2011, but the MDA and others are now floating the idea of putting advancing laser technology on high-altitude unmanned aircraft, bypassing many of the technical challenges associated with operating the ABL from a Boeing 747-400.[52] Directed energies offer the greatest possibilities for boost intercept, a capability that would enormously strengthen MD.

Tightened Budgets

Although the technologies and MD vision seem to be aligned, budgetary concerns are constraining the advancement of the MD system. This is most apparent within the budget of the MDA. First, funding for the MDA has declined by 23 percent since 2007.[53] This is largely the result of cuts in defense spending across the board, and the MDA has been directed to "take its share."[54] Second, a significant portion of the MDA's funding (up to nine percent) has been allocated in past years for research and development (R&D) and procurement for Israel's missile defense.[55] Though few leaders are publicly questioning the benefits of MD cooperation, the "failure to increase MDA's topline to fully cover increased assistance for Israel risk[s] putting U.S. and Israeli missile defense priorities into competition."[56]

Third, the MDA is increasingly responsible for procuring the systems it develops, again without an increased topline. From 2004 to 2008, no MDA money was used for procurement, resulting in between $9 and $10 billion available for research, development, testing, and evaluation (RDT&E) each year (in adjusted 2017 dollars).[57] Since then, not only has the topline fallen, but procurement is annually eating up over $1 billion, leaving RDT&E with only $6 billion in 2016.[58] Senior leaders are voicing warnings over the situation; former Secretary Carter likened it to "eat[ing] our seed corn."[59]

Procurement is also suffering from the arrangement. Because of competition with RDT&E (and Israel), procurement funding for Aegis systems fell by $337 million in FY 2017, relative to the 2016 projected request, and there is no plan in place to fund the last two of the nine THAAD systems requested by the Army.[60]

Yet the MDA is taking the lead in procurement of these systems because the Services are neglecting to do so: "Although the Services frequently proclaim the importance of the ballistic missile defense mission, their budgets for missile defense assets have not reflected it."[61] Contrary to initial intentions, the transfer of successful programs to the Services has not taken place, as it did with PATRIOT.[62] As the MDA fills the gap as best it can, both RDT&E and procurement are under-resourced.

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[51] Missile Defense Agency, "Frequently Asked Questions."
[52] Karako, *Missile Defense and Defeat*, 50-51.
[53] Karako, *The Color of Money*, 4.
[54] Karako, "FY17 Budget Squeezes MDA's Research and Development."
[55] Karako, *The Color of Money*, 6.
[56] Ibid.
[57] Ibid., 5.
[58] Ibid.
[59] Ibid., 4.
[60] Ibid., 15.
[61] Ibid., 20.
[62] Ibid.

MDA and the Services are obviously not alone in facing tighter budgets; JIAMDO has also seen drastic reductions in funding since 2010. This critical organization has lost over 70 percent of its budget, falling from $109.3 million in 2010 to $32.8 million in 2017. Important projects, such as development of homeland surveillance technologies, have ceased as a result.[63] Overall, a likely continued trajectory of tightened budgets calls for organizational innovation and astute prioritization in order to leverage available resources to keep missile defense relevant in the face of expanding threats.

Recommendations

In order to keep pace with or even stay ahead of the dynamic threat environment, and expanding North Korean missile capabilities in particular, it is imperative to make changes to the current management of missile defense. The ongoing MDR is a springboard to draw attention to the threats, highlight current needs, and provide the impetus for change. The MDA's budget must be increased and its focus returned to R&D. The responsibility for procurement and operations and maintenance must be shifted to the Services, and MD should be designated as a Major Force Program (MFP) to protect money designated for it in the Services from being redirected. JIAMDO should be empowered to take a leading role in the current MDR and in continuing to plan, coordinate, and oversee MD development. Finally, the Secretary of Defense should appoint a Special Assistant for Missile Defense to ensure the continued prioritization of MD.

1) Budget

The MDA budget's downward trend must be arrested and reversed, putting the MDA back on a sustainable path. A 23 percent budget decrease since 2007 is entirely incommensurate with the growing missile threat.[64] Without sufficient financial support, the MDA will simply be unable to develop the technology and systems necessary to counter this threat. If the MDA budget continues to atrophy, the United States will be woefully unprepared to defend against advanced missile-capable adversaries in the future, whether North Korea or China.

Of the $54 billion the Administration has requested be transferred from other agencies to the DoD, at least $3 billion should go to the MDA, restoring the agency to its peak-level funding of $10.5 billion (in 2017 dollars).[65] For the DoD this is new money—MDA's budget can be significantly increased for a relatively small slice of the transferred funds and without reducing spending in other DoD programs. This solution should also be politically viable given President Trump's campaign promises to improve missile defense and the heightened public interest surrounding tensions on the Korean Peninsula. The missile threat environment has substantially worsened since the late 2000s; it is high time for the budget to reflect this priority.

[63] Department of Defense, *Fiscal Year (FY) 2017 Request*, 1.
[64] Karako, *Missile Defense and Defeat*, 5.
[65] Karako, *The Color of Money*, 5.

2) Focus

With this influx of funds, the MDA's focus must be returned almost exclusively to R&D. The MDA is the sole agency directly responsible for developing the technology for next-generation missile defenses—if it does not do it, no one will. The promising MD technologies of the future—space-based tracking, space-based kill, multi-object kill vehicles, and high-altitude directed energy UAV platforms—require devoted resources and attention. The MDA must be allowed to concentrate its budget and time on these programs so that they can be brought online as soon as possible. Responsibility for procurement, operations, and management must be shifted to the Services, as originally intended, freeing up for RDT&E the one-third of MDA's budget they currently consume.

Within this refocus, MDA's charter should be redefined to include responses to the expanding cruise and hypersonic glide missile threats. Many of the next-generation MD programs listed above have great potential for countering more than just ballistic missiles. These capabilities should not be left to fall by the wayside because of rigid bureaucratic turf conceptions. A redefinition that emboldens the MDA to push ahead with new technologies, free from questions of strategic restraint, opens the door to technological breakthroughs. While questions of strategic restraint will continue to be addressed by politicians, it should be recognized that in the post-Cold War world, it is U.S. *advantage* that has generated stability, not parity. The MDA's mission must be updated to reflect the current threat environment, or the organization risks operational irrelevance at worst and incompleteness at best.

3) Major Force Program

Transferring responsibility for procurement and operations and management (O&M) to the Services carries the risk that money set aside for these activities will be redirected at the Services' discretion toward their own preferred projects, especially given tighter defense budgets all around. To counter this, additional appropriations must first be allocated to give the Services purchasing power without cutting other programs. This will go a long way toward avoiding resentment and hostility for the MD mission, which is critical to its long-term success. Funding for this in the MDA currently stands around $1 billion; adding this amount to the Services' budgets should be easily feasible if the aforementioned $54 billion increase in the defense budget comes about.[66] If possible, procurement funding should even be increased to $1.5 or $2 billion to enable the acceleration of MD procurement that Service leaders profess to want.[67]

Second, this funding must be protected by law from reallocation within the Services. The precedent for doing this is to designate missile defense as a Major Force Program (MFP), as was done with Special Operations.[68] An MFP designation "aggregates program elements that reflect a force or support mission of the DoD and contains the resources necessary to achieve an objective or plan."[69] This action will largely ensure that the newly-appropriated funding will indeed go to the procurement of MD platforms, creating a robust operational capability over the long term.

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[66] Karako, *The Color of Money*, 5.
[67] Weiss, "Seeing 2020."
[68] Karako, *Missile Defense and Defeat*, 59.
[69] Ibid.

4) JIAMDO

Money and manpower must be returned to JIAMDO. It is the organizational mechanism to coordinate the efforts and needs of the many players implicated in missile defense—the Chairman of the Joint Chiefs of Staff, the MDA, the Office of the Secretary of Defense (OSD), the Services, the Combatant Commands, the interagency, academia, and even the defense industry.[70] Weakening JIAMDO has negative repercussions for the entire spectrum of MD. Its proven track record is a compelling argument for continuing to support it, as summarized by a recent think tank report:

> JIAMDO is the only organization operating across the entirety of DoD's requirements processes. They have proven themselves to be a trusted, disinterested agent able to influence research and development while vetting requirements and monitoring acquisition with no vested interests or agendas other than implementing the chairman's vision for IAMD.[71]

JIAMDO's budget should be restored, perhaps even to its 2010 level of approximately $100 million ($70 million more than currently allocated).[72] Increased funding opens the door to continue and expand projects such as Nimble Fire, "the Department's only joint integrated air and missile defense operator-in-the-loop simulation that is comprised of current and future land, sea, and air weapon systems representing each of the Services AMD capabilities."[73] This project alone has been used to assess homeland defense capabilities against cruise missiles, improve Electronic Warfare capabilities, train carrier strike groups in MD, and explore the impacts of emerging MD capabilities from electronic attack to offensive cyber operations to THAAD-Extended Range.[74] The benefits of continuing such programs are obvious.

Yet JIAMDO is more than a wargame workshop. As the only organization positioned and tasked to view MD from a military-wide perspective, with its knowledge of the operational environment JIAMDO provides the crucial link between the MDA (RDT&E) and the Services (procurement). JIAMDO's broad MD expertise should be leveraged in the current MDR. Giving JIAMDO a leading role in this review will not only enhance its accuracy and soundness but also demonstrate the organization's continued relevance, advancing its preeminence in MD coordination and oversight. If the downward trajectory of JIAMDO's budget and sense of purpose are not reversed, the chain of development, procurement, and operability risks breaking down. This organization is key to a truly integrated missile defense system.

5) Special Assistant to the Secretary

Finally, to sustain top-level knowledge and prioritization of MD development, procurement, deployment, and strategy, Secretary of Defense Mattis should appoint a Special Assistant to the Secretary for Missile Defense (SAMD). Patterned after President Eisenhower's original Special Assistant for Science and Technology, a SAMD will keep MD a DoD priority,

[70] Ibid., 62.
[71] Ibid.
[72] Ibid., 5.
[73] Joint Staff, *PE 0605126J*, 12.
[74] Ibid., 12-13.

defending it to the Secretary from competing demands. The SAMD could be appointed from within the military (past JIAMDO leaders are likely candidates) or from outside (e.g. Thomas Karako, director of the Missile Defense Project at the Center for Strategic and International Studies). This sort of candidate would be chosen for his MD expertise.

An alternative selection criterion could be for a SAMD familiar with basic MD but much more qualified in administration and program management, as James Killian was for President Eisenhower.[75] If desired, the SAMD could even head a small advisory council to provide a fresh set of eyes for the entirety of the DoD's missile defense efforts. While it is true that JIAMDO is well-qualified to supply this sort of analysis, its organizational location under the Joint Chiefs of Staff distances it from the Secretary and creates the possibility of factional disputes if one "leg" of the tripod seems to be attempting to rise above the other two (MDA under OSD, and the Services). A SAMD and a MD advisory council reporting directly to the Secretary would bypass these issues and avoid unnecessary conflict.

A SAMD should be appointed right away so that he can be fully involved in the ongoing MDR. The more the SAMD is engaged in the MDR, the better positioned he will be to advise on and oversee the follow-up deemed necessary by the report. Participating in the review should motivate the candidate, make him intimately aware of the issues, and give him a vested interest in advancing MD according to the review's recommendations.

Most importantly, appointing a SAMD sets a precedent that will greatly contribute to MD's ongoing prioritization and sustainability. While many top DoD leaders frequently reference the need for concerted effort on MD, it is a simple truth that the leadership is confronted with constant demands from a broad array of actors combatting disparate threats. Without a consistent advocate, MD can fall by the wayside and receive little more than lip service—as is evidenced by dramatically decreasing budgets and the lack of progress toward the Joint Staff's IAMD *Vision 2020* goals. A SAMD will have the Secretary's ear, maintaining the level of prioritization missile defense deserves.

As a top-level advocate for MD, the SAMD will be crucial for maintaining financial and institutional support for these programs. Perhaps he can be available to testify before Congress in an effort to sustain budgetary approval and prevent frequent interference in the work of the MDA, the Services, and JIAMDO, giving them the necessary breathing room to get things done. Arguably, this is riskier than keeping a low profile, but the heightened levels of funding MD requires will trigger heightened congressional scrutiny regardless. It is better to offer goodwill and try to build on current bipartisan interest and consensus on the need for MD. The SAMD will be a key player in building a coalition to support MD long into the future.

Conclusion

Clearly dividing the three overarching MD responsibilities—RDT&E, procurement, and coordination—among the MDA, the Services, and JIAMDO is the optimal organization and management structure for advancing U.S. missile defense capabilities. The MDA must focus on research and development, while the Services are in charge of procurement and O&M, and

[75] Killian, *Sputnik, Scientists, and Eisenhower.*

JIAMDO analyzes and coordinates all MD efforts. In these missions, each must be supported with appropriate funding. This clear delineation will concentrate resources in each organization along its comparative advantage and facilitate rapid improvements in real, operational MD capabilities.

Meanwhile a Special Assistant to the Secretary for Missile Defense will keep MD a high-priority issue, preventing it from being buried beneath a mountain of competing demands. Without this, the momentum generated from the MDR and a new administration risks petering out, as it has before, leaving MD an aspirational capability unequipped to deal with the worsening threat environment.

Acronym List

ABL	Air-Borne Laser
ABM	Anti-Ballistic Missile
ABMT	Anti-Ballistic Missile Treaty
BMD	Ballistic Missile Defense
BMDO	Ballistic Missile Defense Organization
BMDR	Ballistic Missile Defense Review
DARPA	Defense Advanced Research Projects Agency
DoD	Department of Defense
DPRK	Democratic People's Republic of Korea
IAMD	Integrated Air and Missile Defense
ICBM	Intercontinental Ballistic Missile
IRBM	Intermediate-range Ballistic Missile
JIAMDO	Joint Integrated Air and Missile Defense Organization
JTAMDO	Joint Theater Air and Missile Defense Organization
MD	Missile Defense
MDA	Missile Defense Agency
MDR	Missile Defense Review
MFP	Major Force Program
MOKV	Multi-object Kill Vehicle
MRBM	Medium-range Ballistic Missile
O&M	Operations and Management
OSD	Office of the Secretary of Defense
SAMD	Special Assistant to the Secretary for Missile Defense
SDIO	Strategic Defense Initiative Organization
THAAD	Terminal High Altitude Air Defense
UAV	Unmanned Aerial Vehicle

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