

JULY 2020

# Offense–Defense Integration for Missile Defeat

*The Scope of the Challenge*

AUTHOR  
Brian R. Green

A Report of the  
CSIS MISSILE DEFENSE PROJECT

CSIS | CENTER FOR STRATEGIC &  
INTERNATIONAL STUDIES

JULY 2020

# Offense-Defense Integration for Missile Defeat

*The Scope of the Challenge*

AUTHOR

Brian R. Green

A Report of the CSIS Missile Defense Project

CSIS | CENTER FOR STRATEGIC &  
INTERNATIONAL STUDIES

# About CSIS

The Center for Strategic and International Studies (CSIS) is a bipartisan, nonprofit policy research organization dedicated to advancing practical ideas to address the world's greatest challenges.

Thomas J. Pritzker was named chairman of the CSIS Board of Trustees in 2015, succeeding former U.S. Senator Sam Nunn (D-GA). Founded in 1962, CSIS is led by John J. Hamre, who has served as president and chief executive officer since 2000.

CSIS's purpose is to define the future of national security. We are guided by a distinct set of values—nonpartisanship, independent thought, innovative thinking, cross-disciplinary scholarship, integrity and professionalism, and talent development. CSIS's values work in concert toward the goal of making real-world impact.

CSIS scholars bring their policy expertise, judgment, and robust networks to their research, analysis, and recommendations. We organize conferences, publish, lecture, and make media appearances that aim to increase the knowledge, awareness, and salience of policy issues with relevant stakeholders and the interested public.

CSIS has impact when our research helps to inform the decisionmaking of key policymakers and the thinking of key influencers. We work toward a vision of a safer and more prosperous world.

CSIS is ranked the number one think tank in the United States as well as the defense and national security center of excellence for 2016-2018 by the University of Pennsylvania's "Global Go To Think Tank Index."

CSIS does not take specific policy positions; accordingly, all views expressed herein should be understood to be solely those of the author(s).

**© 2020 by the Center for Strategic and International Studies. All rights reserved.**

Center for Strategic & International Studies  
1616 Rhode Island Avenue, NW  
Washington, D.C. 20036  
202-887-0200 | [www.csis.org](http://www.csis.org)

# Acknowledgments

The author is indebted to those who have reviewed and commented on earlier drafts of this work, in particular Tom Karako, Archer Macy, Richard Formica, Ian Williams, Shaan Shaikh, Wes Rumbaugh, and other anonymous reviewers. Their comments and criticism have much improved this work; any flaws or failures that remain are my responsibility alone.

This report is made possible by general support to CSIS. No direct sponsorship contributed to this report.

# Contents

Acknowledgments	III
Introduction	1
Barriers to Integration and a Sparse Discourse	3
<i>Shifting Paradigms</i>	5
ODI Characteristics	7
<i>ODI Mindset?</i>	7
<i>Offense, Defense, and Integration</i>	7
<i>Scope</i>	8
<i>Multi-domain, Multi-service Operations</i>	10
<i>Air and Missile Defense</i>	10
<i>A Definition of ODI for Missile Defeat</i>	10
Achieving ODI	12
<i>Policy and Strategy</i>	12
<i>Managing Allies</i>	14
<i>Managing Adversaries</i>	14
<i>Weaponizing Space</i>	15
<i>Preemption</i>	15
<i>Doctrine</i>	16
<i>Offense and Defense</i>	16
<i>Command and Control (C2)</i>	18
<i>Materiel and Acquisition</i>	20
<i>Force Structure and Weapon Systems</i>	20
<i>Launchers and Weapons</i>	23
<i>Organization</i>	24
<i>Operational Organizations</i>	24
<i>Training Organizations and Personnel</i>	25
<i>Acquisition Organization</i>	26
Conclusion	28
About the Author	29

# Introduction

A central theme of the 2019 *Missile Defense Review* (MDR) is the desirability of integrating offensive forces with active and passive defenses. “If deterrence and diplomacy fail and conflict with a rogue state or within a region ensues,” the MDR says, “U.S. attack operations supporting missile defense will degrade, disrupt, or destroy an adversary’s missiles before they are launched.”<sup>1</sup> The document calls for the United States to integrate missile defenses with both strike forces and information, surveillance, and reconnaissance (ISR) assets to provide “the broadest set of options in a crisis or conflict and [improve] the overall likelihood of countering offensive missile attacks.” Such an approach is said to be necessary to “a comprehensive missile defense strategy.”<sup>2</sup> But what would the realization of such a comprehensive and integrated approach look like, and what would it require?

*What would the realization of such a comprehensive and integrated approach look like, and what would it require?*

The MDR’s attention to offense-defense integration (ODI) is part of a long, slowly intensifying trend. In November 2014, then-Army Chief of Staff General Raymond Odierno and Chief of Naval Operations Admiral Jonathan Greenert signed out an “eight-star memo” to Secretary of

Defense Chuck Hagel questioning the extant approach to dealing with missile threats. The memo contended that the “present acquisition-based strategy is unsustainable in the current fiscal environment” and, in the somewhat ambiguous observation that current strategy “favors forward deployment of assets in lieu of deterrence-based options to meet contingency demands,” also raised questions on the best balance of defenses and offenses. They called for “a holistic approach that is more sustainable and cost-effective, incorporating ‘left-of-launch’ and other non-kinetic means of defense.”<sup>3</sup> Congress likewise expressed interest in ODI through its 2017 statutory requirement for a “missile defeat review,” directing the Department of Defense to examine U.S. policy, plans, posture,

---

1. Office of the Secretary of Defense (OSD), *Missile Defense Review* (Washington, DC: Department of Defense, 2019), ii, <https://media.defense.gov/2019/Jan/17/2002080666/-1/-1/2019-MISSILE-DEFENSE-REVIEW.PDF>.

2. Ibid.

3. “Document: Army-Navy Memo on need for Ballistic Missile Defense Strategy,” USNI News, March 19, 2019, <https://news.usni.org/2015/03/19/document-army-navy-memo-on-need-for-ballistic-missile-defense-strategy>. Another interpretation of the memo, offered by former Commander of the U.S. Army Space and Missile Defense Command LTG Richard Formica (USA, Ret.), is that it was intended to curb the regional COCOMs’ apparently insatiable appetite for more air and missile defenses.

strategy, and capabilities to defeat adversary ballistic missiles both before and after launch.<sup>4</sup> In April 2017, the Joint Staff released new doctrine on integrated air and missile defense.<sup>5</sup> In May 2020, U.S. Army leadership expressed interest in better integrating its offensive fires with its defenses by using data from its future air and missile defense command and control system.<sup>6</sup>

Despite broad and sustained interest, little progress has been made in the actual integration of offenses with defenses, or even clearly elucidating and defining the concept. The 2019 MDR touches on some of the policy, strategy, planning, and command and control (C2) aspects of ODI, but efforts to generate more in-depth understanding and action have largely foundered.<sup>7</sup> To take one example, two of the U.S. Army's six modernization priorities include long-range precision fires and air and missile defense. Despite locating both priorities' cross-functional teams in the same building, plans for integrating their capabilities remain quite distant.

This essay considers what ODI means and what it could mean for the U.S. military. Four major themes will be evident:

- ODI is more critical today than it has been in the past and represents an essential concept for achieving military advantage in the future. As the air and missile threats on the modern battlefield become faster, more complex, and more lethal, measures that help U.S. forces survive and increase combat efficiency will be paramount.
- ODI is relevant not just to ballistic missile defense (BMD) operations but to countering a variety of other missile threats as well.
- A thorough implementation of ODI would touch almost every aspect of the U.S. military, including policy, doctrine, organization, training, materiel, and personnel. It would require a fundamental rethinking of terms such as “offense” and “defense” and of how the joint force fights.
- Integration has limits. While desirable, complete ODI down to the tactical level will be technically and operationally difficult to achieve. Even where possible, its realization will be neither rapid nor easy.

Improved ODI would go a long way to countering modern missile threats. But ODI is not a panacea. A better appreciation of its benefits and challenges should give decisionmakers a better sense of how to proceed.

---

4. Public Law 114–328, National Defense Authorization Act for Fiscal Year 2017, Sec. 1684. Review of the Missile Defeat Policy and Strategy of the United States.

5. Joint Chiefs of Staff, *Joint Publication 3-01, Countering Air and Missile Threats* (Washington, DC: April 21, 2017), [https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp3\\_01\\_pa.pdf](https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp3_01_pa.pdf).

6. Sydney Freedberg, “Project Convergence: Linking Army Missile Defense, Offense, and Space,” *Breaking Defense*, May 18, 2020, <https://breakingdefense.com/2020/05/project-convergence-linking-army-missile-defense-offense-space>.

7. OSD, *Missile Defense Review*, 35, 47.

# Barriers to Integration and a Sparse Discourse

Until recent years, a combination of political, technical, and organizational barriers have inhibited progress toward ODI. Missile defense entered the modern stage in 1983 with President Reagan’s announcement of his intent to develop a shield to protect the nation from strategic nuclear attack. From the beginning, this conception presumed a sharp distinction between the operation of offensive and defensive forces. To be sure, both defense and offense would contribute to deterrence but would operate through different mechanisms. The point of missile defenses was to provide a moral alternative to the Faustian bargain of preventing war through the threat of mass slaughter. This perspective may have reached its apex with the introduction of the so-called “New Triad” in the 2002 *Nuclear Posture Review*. The New Triad consisted of nuclear and non-nuclear offensive strike forces, active and passive defenses, and responsive infrastructure to provide a more effective means of deterring adversaries and assuring allies.

The opposing point of view was that defending against missile attacks could not be separated from warfighting, and nuclear warfighting was, in a word, wrong. Missile defenses were likely to provoke at least an arms race—an adversary would maintain an effective deterrent by overcoming the defenses with additional or more sophisticated offenses. At worst, they were thought likely to provoke a preemptive attack during a crisis. From this perspective, it was best to avoid the integration of offenses and defenses altogether.

The integration of offenses and missile defenses has not been as controversial at the shorter-range theater level but has proven challenging nonetheless. The 1991 Gulf War demonstrated some of the technological and operational hurdles to ODI. This conflict featured both the defense of troops and allies from Iraqi Scud attacks by first-generation Patriot interceptors and the use of airpower in massive hunts for Scud missiles and launchers. The Patriot interceptors, however, achieved only limited success, and the Scud hunt was a failure. Very few mobile launchers or missiles—possibly none—were destroyed on the ground.<sup>8</sup>

---

8. William Rosenau, *Special Operations Forces and Elusive Enemy Ground Targets: Lessons from Vietnam and the Persian Gulf War*, MR-1408-AF (Santa Monica, CA: Project Air Force/RAND, 2001), 29-44, [https://www.rand.org/pubs/monograph\\_reports/MR1408.html](https://www.rand.org/pubs/monograph_reports/MR1408.html).



The Gulf War was the first conflict in which the U.S. military used both offensive and defensive operations in attempting to defeat the ballistic missile threat. The United States failed to follow up on this experience with a concerted effort to better integrate offenses and defenses. Several factors may have contributed to this. Until recently, for example, missile defenses were too immature to make ODI useful or relevant in shaping U.S. forces or doctrine. The concept of the New Triad, for example, was introduced when the United States had deployed only Patriot short-range missile defenses and had no national missile defenses at all. Likewise, the difficulty for offensive forces in finding and killing ballistic missiles inhibits operational integration, and if neither offense nor defense is up to the task, thinking about integrating the two seems irrelevant and unrealistic. Finally, the slow adoption of missile defense as a core mission by the services has also contributed to the divide between strike and defense.

Given these barriers, it is perhaps not surprising that the discussion of ODI's meaning, implementation, and implications has been relatively cursory. Writing in 2002, General John Piotrowski, former commander of U.S. Space Command, suggested the need to move beyond "ODI" at a simple level to what he called offense-defense "synchronization." He described this synchronization as an approach to coordinate offensive and defensive forces in a more detailed way, integrating the command and control of diverse systems. He further urged that theater offensive actions that had the potential to trigger ballistic missile attacks against the United States or its allies should be well coordinated with defensive forces.<sup>9</sup>

Published a decade later, *Joint Vision 2020: Integrated Air and Missile Defense* fails to offer much deeper analysis. The document takes note of increasing threats and the impracticality of meeting these threats exclusively with defensive means. The solution outlined includes full leveraging of information; "interdependent Joint and Combined force employment" to achieve "efficiency and economy of forces" (a suggestive but not entirely clear phrase); development of technology to fill gaps in integrated air and missile defense (IAMD) capabilities; and passive defenses. This formulation points to the use of joint and combined forces and some additional aspects of integration. But the consideration of the integration of offense and defense remains firmly rooted in efficiency and economy of forces, and the document omits the complexities that might be involved in achieving comprehensive integration.<sup>10</sup>

The eight-star memo from 2014 further stimulated discussion about the left-of-launch concept and its relationship to missile defense. The 2012 and 2017 updates to *Joint Publication 3-01, Countering Air and Missile Defense Threats* provided additional insights, and the 2019 MDR moves the needle a little more by noting areas of concern as the U.S. military ties together its offenses and defenses. But beyond that, the public discussion has largely focused on the cost of missile defenses and on regional threats at a simple operational level. Defenses cannot keep up because interceptors cost more than offensive fires. In this more common usage, ODI thus offers a course of action with a

---

9. John Piotrowski, *Strategic Synchronization: The Relationship Between Strategic Offense and Defense* (Washington, DC: Heritage Foundation, 2002).

10. Joint Chiefs of Staff, *Joint Integrated Air and Missile Defense: Vision 2020* (Washington, DC: 2013), <https://www.jcs.mil/Portals/36/Documents/Publications/JointIAMDVision2020.pdf>.

simple end in mind: active defenses need supplementation with theater offenses to make the defensive job more tractable, attacking missiles and their support systems before launch to thin the herd.

This relatively straightforward observation is valid as far as it goes. But a simple reflection on the inadequacy of defenses and the need for offensive forces to help protect the U.S. homeland, allies, and deployed military hardly does justice to the complexity inherent to ODI.

## *Shifting Paradigms*

Changes in technology, policy, and threats seem to be breaking down some of the past barriers to integration. The United States and numerous allies and partners have deployed missile defenses in substantial numbers over the past decade. Missile threats are becoming more central to the familiar context of military competition, not an isolated mission that “those people over there” need to do.

These evolutions in threats are driving U.S. leaders to look for means to reestablish a military edge. The United States long enjoyed going anywhere whenever it wanted to attack and destroy its enemies. That is no longer the case. Russian and Chinese military capabilities have grown rapidly over the past decade. These increases include the capacity and accuracy of ballistic missiles, along with sensors, C2, and an anti-access/area denial operational concept to inform their use. Adversaries such as North Korea and Iran present similar challenges, if on a different scale. Threat complexity likewise continues to increase, including terminal maneuvering threats and hypersonic glide weapons that cruise along the upper atmosphere. This nexus of quantity, precision, speed, complexity, and support from ISR has made the future battlefield far more lethal.

Furthermore, the military can no longer deal with this as “the missile threat.” In the words of the then-Director of the Joint Integrated Air and Missile Defense Organization (JIAMDO) Rear Admiral Edward Cashman in 2016, “With the development of depressed-trajectory ballistic missiles, guided and maneuvering reentry

vehicles, hypersonic glide weapons, as well as supersonic and very-long-range subsonic cruise missiles, the threats present a complex and nearly continuous threat spectrum across the characteristics of altitude, speed, propulsion type, and range.”<sup>11</sup> At the bottom end of this spectrum is more precise rockets, missiles, and artillery supported by a new generation of tactical ISR drones. But as Cashman notes, the lines between categories of threats—air, missile, rocket, and artillery—grow both fuzzier and more opaque.

*The United States long enjoyed going anywhere whenever it wanted to attack and destroy its enemies. That is no longer the case.*

Given these trends, neither improved offenses nor active kinetic defenses alone will be able to keep pace. The MDR describes a range of ongoing and new missile defense efforts but also recognizes the disparity in cost and numbers between threat missiles and interceptors. ODI

---

11. Edward Cashman, “The Missile Defeat Posture and Strategy of the United States – The FY17 President’s Budget Request,” Statement before the House Armed Services Committee Subcommittee on Strategic Forces, April 14, 2016), <https://docs.house.gov/meetings/AS/AS29/20160414/104621/HHRG-114-AS29-Wstate-CashmanE-20160414.pdf>.

can help address these disparities and otherwise counter adversaries' anti-access/area denial strategies. If U.S. forces are to maneuver, survive, and win on this new battlefield, the use of defenses to protect U.S. forces from "arrows" already launched, effectively integrated with offenses to "kill the archer," will be critical to any future concept of operations.

# ODI Characteristics and a Definition

Thus far, the term “offense-defense integration” has been used with an intuitive sense of what the phrase means. Spending some effort defining it, however, is necessary since the nature of ODI’s implications will depend largely on what is meant by “offense-defense integration.”

## *ODI Mindset?*

One strain of thought holds that ODI is not a program to implement but a mindset for execution. In this view, ODI is something of a false challenge. Commanders today integrate offense and defense all the time, as have commanders since the dawn of military operations. They use the tools and tactics they have, both offensive and defensive, to achieve their military objective. The center advances and the flanks are defended. Offensive counterair protects the troops on the ground. From this perspective, operational integration of offense and defense is routine and long established, even for the ballistic threat. During the Cold War, the Army devised operational plans to negate Soviet advantages in artillery range and performance. These included seizing the initiative (no time for the Soviets to gather themselves to attack), attacking the Soviet sensor architecture (can’t see, can’t attack), attacking artillery (left of launch), and responding with effective counter-battery fire.<sup>12</sup>

Looking at this example, one might wonder if ODI has not always been with us. Nevertheless, the strong and growing interest in ODI implies that the United States has not arranged its offenses and defenses to deal with missile threats as they are evolving. Many believe that something is missing, which raises questions about what the U.S. military is *not* doing and what it should be doing better.

## *Offense, Defense, and Integration*

One reasonable place to begin is by defining “offense” and “defense.” The *DoD Dictionary of Military and Associated Terms* defines neither. One sense is that “offense” and “defense” are operational terms and refer to intent or a goal (my operation will seize the initiative;

---

12. The author thanks LTG Richard Formica, USA (Ret.), for his description of the Army’s efforts to counter Soviet artillery; he has offered this description in remarks at several events sponsored by the Air Force Association, the Mitchell Institute, and CSIS.

my action will blunt an enemy initiative). In another sense, offense refers to “attack” and defense to “resistance to attack.” There is also a technical sense in which systems reflect offense and defense. In essence, some missiles seem to be “offensive,” in that friendly forces fire them with the intent of hurting the enemy, and others seem to be “defensive” because they seek to prevent the enemy from hurting friendly forces. Each sense sheds light on the notion of ODI, but none captures all of it. Indeed, at the level where militaries shoot at each other, these distinctions begin to blur.

With “integration,” the DoD Dictionary is more helpful, defining it as, “The arrangement of military forces and their actions to create a force that operates by engaging as a whole.”<sup>13</sup> “Engaging as a whole” is undefined but intuitively would seem to mean something like operating as a single entity, without division, seams, or gaps, or at least those that matter. “Arranging” forces suggests organizational, training, personnel, and even doctrinal aspects of integration. “Actions” of those forces suggest command control and the capabilities needed to engage as a whole. This definition, while brief, starts to point to some of the idea’s technical and operational complexity.

How much “integrating” is enough? Does it entail the *elimination* of the gaps that preclude “engaging as a whole”—or is narrowing them enough? The term “integration,” as defined, seems to suggest a maximalist approach, beyond just “deconfliction” (avoiding fratricide) or “coordination” (two or more entities working toward a common goal).<sup>14</sup> Consider two definitions of “interoperable”:

- “The ability to act together coherently, effectively, and efficiently to achieve tactical, operational, and strategic objectives”<sup>15</sup>; and
- “The condition achieved among communications-electronics systems or items of communications-electronics equipment when information or services can be exchanged directly and satisfactorily between them and/or their users.”<sup>16</sup>

The operational half—“acting together coherently”—might capture combined arms or joint operations but seems to fall short of the standard of “arranging” to “operate as a whole.” The technical half focused on information or services that can be “exchanged directly” seems closer to the standard of operating as a whole. Whether built in as part of a unified development effort or a subsequent addition, such integration would provide the critical technical backbone of C2, communications, and battle management needed to allow offensive and defensive forces to “operate as a whole.”

## Scope

Operational scope is another issue. For instance, while General Piotrowski’s insights and technical descriptions focus on the strategic nuclear aspects of both offense and

---

13. Joint Chiefs of Staff, *Joint Publication 1-02: Department of Defense Dictionary of Military and Associated Terms* (Washington, DC: 2015), 116, <https://www.hsdl.org/?abstract&did=750658>.

14. The author thanks Dr. Tom Karako for his unpublished thoughts on concepts of “integration.”

15. Joint Chiefs of Staff, *Joint Publication 3-0: Joint Operations* (Washington, DC: 2017), GL10, [https://fas.org/irp/doddir/dod/jp3\\_0.pdf](https://fas.org/irp/doddir/dod/jp3_0.pdf).

16. Joint Chiefs of Staff, *Joint Publication 6-0: Joint Communications System* (Washington, DC: 2015), 1-7, [https://fas.org/irp/doddir/dod/jp6\\_0.pdf](https://fas.org/irp/doddir/dod/jp6_0.pdf).

defense, his analysis suggests that one ought to consider ODI at the different levels of war, regardless of a missile's payload.

Interest in ODI has often arisen in the context of regional missile threats, generally presumed to carry conventional warheads. The spectrum of conflict, however, is much broader. Threats to U.S. interests range from artillery to ICBMs, conventional to nuclear, ballistic to non-ballistic, and tactical to global, while time frame can vary from seconds to decades. Meeting any of these threats requires a critical examination of the most effective means to defeat them. Thus, there are no obvious or compelling reasons to limit ODI to conventional or regional missile warfare. ODI will, therefore, be considered here as a concept that is generally applicable to each of the different levels of military conflict: strategic, theater, and tactical.

- At the **strategic** level, overall goals (ends) and means are defined. ODI might result in strategy documents that refocus deterrence from an offensive emphasis to an approach more balanced between offense and defense and provide specific direction to the services to incorporate this approach.
- At the **operational** level, forces are coordinated to achieve strategic goals. At this level, significant effort might attach to C2, communications, battle management, sensors, and planning to ensure that offensive and defensive forces fight as an integrated whole to achieve global and regional objectives.
- At the **tactical** level, forces fight battles, and units, platforms, and individuals are shooting at each other. At the tactical level, the effort to integrate all the tools of warfare to defeat the missile threat would encompass C2, communications, sensors, and shooters.

One should note further that the threat time frame for each level varies, but the minimums for each ranges from minutes to seconds. The dominant factors that make today's battlefield more lethal for American forces—information, speed, precision, complexity, and quantity—both drive the interest in ODI and help shape how to think about it. In the words of one authority: “today's operations . . . [are] characterized by a compression, if not elimination, of meaningful distinctions between strategic, operational, and tactical processes and rapidly shrinking windows of opportunities for effective action.”<sup>17</sup> One key in such operational compression is the ability to act decisively faster than the adversary, regardless of the level of conflict—to defeat initial attacks and kill the attacker before they can react and move again. A more thorough-going integration of offensive and defensive forces is one way to adapt to new threats within the very short time frames characteristic of the modern battlefield.

At each of these levels, the implications of ODI extend to how the United States prepares its forces to fight. ODI could provide compelling advantages—greater military efficiency and effectiveness, fewer losses, and more effective deterrence of conflict. To exploit these advantages, the U.S. military must engage in the intricate processes of developing materiel and systems that work together. Such products also require doctrine to guide their use

---

17. David S. Alberts and Richard E. Hayes, *Understanding Command and Control* (Washington, DC: CCRP Publications, 2006), 61, [http://www.dodccrp.org/files/Alberts\\_UC2.pdf](http://www.dodccrp.org/files/Alberts_UC2.pdf).

and optimal organization and training for servicemen and women—something akin to a DOTML (doctrine, organization, training, materiel, and logistics) approach to the task of analyzing and understanding its implications. These processes are time consuming, but a complete conception of ODI must include them.

*These processes are time consuming, but a complete conception of ODI must include them.*

#### **MULTI-DOMAIN, MULTI-SERVICE OPERATIONS**

Among ways of adapting to new threats, foremost is multi-domain battle (MDB). MDB is an operational concept intended to counter improved adversary technology by creating and exploiting temporary advantages and applying those

advantages across domains when and where needed. The missile defeat mission is almost inevitably going to be executed across domains and arguably will be necessary to gain needed advantages to prosecute other cross-domain operations successfully. Operating across domains will certainly involve cross-service operations as well.

#### **AIR AND MISSILE DEFENSE**

A particular challenge of ODI applies to the relationship of missile defense to air warfare. Air and missile defenses are related, and integrating air and missile defenses has been an aspiration for many years. Increasingly blurred lines between air and missile threats, the need for a common threat picture among air forces and missile defenses, and increasingly common hardware are all indicators of this relationship. Adversary air forces, including cruise missiles, aircraft, and hypersonic systems, often operating in coordination with missile forces, can and will pose threats to U.S. military forces, including defensive assets, and are part of the overall ODI picture. *Joint Publication 3-01, Countering Air and Missile Threats* (JP 3-01) highlights the commonalities and parallels. It also highlights that “offensive counterair” includes attack missions on enemy missile sites and infrastructure. Thus the operational sinew and mindset for ODI seem to be growing. Nevertheless, JP 3-01 also focuses on aerial operations—planning, deconfliction, command relationships, and so on—and much thought has gone into air operations more generally as they pertain to the defeat of enemy air forces. While very important in their own right, these challenges are distinct from those addressed by the MDR or the eight-star memo.

#### **A DEFINITION OF ODI FOR MISSILE DEFEAT**

Inevitably, some of the boundaries of ODI as it pertains to missile defeat are going to be somewhat fuzzy. The dividing line between air and missile defense is becoming less obvious and suggests greater integration will be needed. Nevertheless, not all air defense is relevant to missile defeat. Likewise, how far down in the tactical chain should be captured seems like a relevant question. The ODI concept itself may apply to virtually all combat, but not all combat forces will be integrated to defeat the missile threat.

With the above as background, this examination will focus on the various facets of ODI defined as: “The seamless, time-urgent use of offensive and defensive forces, in all domains, to deter, degrade, and defeat adversary use of ballistic and non-ballistic missiles or the projectiles they release.”<sup>18</sup>

---

18. This definition—perhaps any definition—will leave some unsatisfied. RADM Archer Macy, former director of JIAMD, for example, argues that the lines between air and missile defense have been blurred to point that ODI should be

This definition encompasses the use of offensive forces to attack the missile threat throughout the kill chain and defensive forces to intercept targets in any phase of flight. This focus has the merit of attending to the new threats that are driving interest in ODI, and the new capabilities and mindsets needed to address them. This examination will use the terms *offense* and *defense* in a relatively narrow sense. Offensive systems kill the enemy and prevent enemy offensive systems from launching. Defensive systems kill enemy offensive systems after they launch.<sup>19</sup>

This above definition, however, is not how the military operates in the missile defeat realm today. In the fast and lethal battlefield of the future, operating within the enemy's decision loops will be critical to survival. Operating as a whole—one of the keys to this definition—will be essential to operating fast and effectively. And all the other aspects of the definition work to make “operating as a whole” difficult. The complex nature of the missile defeat mission creates technical, operational, and organization seams between offensive and defensive forces that inhibit their ability to operate as a whole. ODI, then, involves the narrowing or complete elimination of these seams.

All this makes the potential implications of a thorough-going integration of offense and defense more profound, far-reaching, textured, and complex than the simple observation that offenses should supplement missile defenses. Such integration can shape and reflect how the U.S. military intends to acquire, train, plan, and ultimately use offenses and defenses in concert. In essence, something akin to using a DOTML (doctrine, organization, training, materiel, and logistics) approach is needed to analyze and understand its implications. These implications need to be understood in much more depth.

*In the fast and lethal battlefield of the future, operating within the enemy's decision loops will be critical to survival.*

---

defined to cover all air threats, regardless of origin and that any differences between air and missile defense are “purely engineering.” One could make a good case that all differences in weapons systems are purely engineering and that every weapon (“offensive” or “defensive”) has a target and is engineered according to the characteristics of the target it is intended to interdict. The focus on the missile threat is related to the characteristics of those threats, which still differ from those of, say, aircraft. Although the line is fuzzy, it still seems that the focus is useful.

19. Passive defenses, while important, are just that—passive. They require considerable planning and execution prior to military conflict but generally not much in the way operational implementation and not much coordination with offenses. They are therefore not considered in this essay. Hardening, burying, hiding, moving, spoofing, and other forms of passive defense will obviously have to be coordinated with active defenses.



# Achieving ODI

So, what will change if the U.S. military were to pursue ODI vigorously?

The answer will depend in some measure on how far and fast the military wants (or believes it needs) to go. Military revolutions are often a complex mix of the *desirable* and the *possible*. What is possible relates to technological development. What is desirable often relates to the effectiveness of hypothesized capabilities, but culture also shapes desirability. Some ideas may be deemed morally unacceptable (“I do not like nuclear warfighting”), and others may simply fall into the category of “that is not what we do” or perhaps “not how we do it.”

*If the military is serious about pursuing ODI, much would change.*

What is clear is that if the military is serious about pursuing ODI, much would change. The changes could touch everything from high-level strategy to more mundane aspects of how weapons are acquired. A serious examination of

these aspects will help determine what is necessary to achieve such integration, how quickly it can be done, and the best path to get there.

## *Policy and Strategy*

U.S. strategy documents are guided by principles, overarching policy decisions, and direction provided by senior leadership. The level of analysis of very high-level strategy documents such as the *National Security Strategy* rarely descends to the level that would address ODI directly. Still, these documents do stimulate policy at lower decisionmaking tiers. These policies then guide specific actions and activities such as doctrine, R&D, acquisition, and alliance relationships that constitute the meat on the strategic bones. These top-level documents today include suggestive statements that would pertain to the integration of offenses and defenses but are not definitive. A shift toward ODI as it pertains to the defense of the homeland from strategic nuclear attack—a fundamental shift in strategy—would probably require clear, high-level policy direction.

The most recent U.S. *National Defense Strategy* includes several relevant facets. It identifies salient threats from Russia, China, North Korea, Iran, and terrorism and identifies the long-term strategic competition with Russia and China as DoD’s top priority. It also notes an increasingly “lethal and disruptive” battlefield and “rapid technological advancements.” It identifies “deterrence of attack against our

vital interests” as a key goal. But it also identifies “defending allies from military aggression” and “defending the homeland” distinctly—perhaps crucially—as separate strategic goals.

Perhaps the most profound questions that ODI generates relate to deterrence and defense against a strategic nuclear attack on the U.S. homeland. The 2018 *Nuclear Posture Review* (NPR) starts to address some of this at the policy level. It specifically identifies U.S. defensive forces as essential means of deterring and defeating North Korea and Iran and notes that U.S. offensive and defensive forces in combination will allow the United States to “stay ahead of the threat.”<sup>20</sup> But while some of these statements suggest a deterrence approach more balanced between offense and defense, the NPR avoids consideration of offenses and defenses working together to counter homeland threats posed by Russia and China.

The 2019 MDR also reflects this avoidance. The MDR clearly states that the focus of homeland missile defense efforts remains on rogue states and that the United States relies on nuclear retaliation to deter nuclear attack by Chinese intercontinental ballistic missiles.<sup>21</sup> The MDR also details the strategies and technology that Russia and China are developing to undermine U.S. military advantages. These include extensive modernization and expansion of strategic nuclear forces, anti-access/area denial strategies, new ballistic missiles, and hypersonic glide vehicles. For regional conflict, the MDR is clear: attack operations, integrated with active and passive defenses, are part of the comprehensive effort to deter and defend against missile attack. Although not explicitly stated, the implication is clear that this includes regional defense against Russia and China.<sup>22</sup>

As strike forces and defenses become progressively more integrated to defend against rogue threats to the homeland, one might reasonably infer that these new capabilities would be available against anyone attacking U.S. soil, including China or Russia. A high-level commitment to ODI as the most effective means of deterring peer or near-peer strategic nuclear attacks would represent a revolution in strategic nuclear thinking. It would drive significant changes in how the United States defines deterrence, nuclear doctrine, offensive and defensive programs, response options, and targeting.<sup>23</sup>

---

20. “The goal of limiting damage if deterrence fails in a regional contingency calls for robust adaptive planning to defeat and defend against attacks, including missile defense and capabilities to locate, track, and target mobile systems of regional adversaries. These and other non-nuclear capabilities, which we are now strengthening, can complement but not replace U.S. nuclear forces for this purpose. In the case of missile threats from regional actors in particular, U.S. missile defense and offensive options provide the basis for significant damage limitation in the event deterrence fails.” Department of Defense, *Nuclear Posture Review* (Washington, DC: Department of Defense, 2018), 23, <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>. The Obama administration strategy documents included nothing about the integration of offenses and missile defenses. The 2010 *Nuclear Posture Review* stated that theater defense contributes to deterrence and regional stability but that missile defenses upset our peer- and near-peer rivals and undermine strategic stability. The 2010 *Ballistic Missile Defense Review* admitted to a limited defense of the United States focused on the threats being developed by North Korea and potentially Iran, but there is no discussion of defending the nation or reinforcing deterrence with respect to China or Russia, and presumably no intent to integrate U.S. offenses and missile defenses to those ends.

21. OSD, *Missile Defense Review*, ix, 33.

22. *Ibid.*, 31.

23. Deterrence as defined today has a distinctively offensive cast: “the prevention of action by the existence of a credible threat of unacceptable counteraction and/or belief that the cost of action outweighs the perceived benefits.” Joint Chiefs of Staff, *Dictionary of Military and Associated Terms* (Washington, DC: Updated January 2020), 67, <https://www>.

## MANAGING ALLIES

The MDR identifies greater integration of U.S. missile defenses with those of its allies as a key goal, but ODI adds complexity to that effort. How U.S. allies will respond to policies and actions that integrate offenses and defenses is an open question. Those reactions would vary depending on the nation, its leaders, and the specifics of any contingency in which the United States and its allies might be engaged. A fundamental challenge would be to convince allies that this integration will more effectively deter or defeat adversaries and will not result in escalation or expansion of a conflict in ways that will involve them.

Japan has a long history of aversion to offensive actions and has since World War II viewed its military as a purely defensive instrument. While this posture may be gradually changing, ODI could cause discomfort in Japanese leadership and present practical challenges in structuring the guidelines of U.S.-Japanese military cooperation.

South Korea, on the other hand, could be quite different. South Korea has historically been unreceptive to cooperative missile defense development with the United States and, at times, showed reluctance to allow the United States to expand its missile defenses in Korea. Nevertheless, as threats from the North grew, the South Korean military developed an aggressive approach involving air and missile defenses integrated with preemptive strikes against North Korean forces and “massive punishment and retaliation” focused on decapitation strikes against North Korean leadership.<sup>24</sup> This blending of offense and defense, intended to deter North Korea and deter and defeat the North Korean military suggests an openness to working with the United States on ODI-related efforts.

Managing reactions of NATO allies will be another challenge. As a rather fractious alliance of 29 nations with their own strategic interests and concerns, NATO could respond inconsistently to any significant change in U.S. nuclear or conventional warfighting doctrine. To the extent that the United States would direct such moves toward Russia, new members of the alliance from Eastern Europe might be receptive and anxious to cooperate. Older members from the West might be less enthusiastic. Underlying these considerations, however, is a relatively straightforward NATO policy that recognizes the value of nuclear forces for deterrence, the importance of missile defense as a complement to nuclear forces, and the importance of conventional forces to European defense.<sup>25</sup> NATO has been relatively receptive to missile defenses, perhaps because of, or rather to the extent that it fits nicely with, the distinctly defensive orientation of the alliance. The challenge for the United States might be persuading NATO allies that the “offense” in ODI is a good idea, geared ultimately to the defense of NATO and not the defeat of any one foreign power.

---

jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf.

24. Kyle Mizomaki, “This is How South Korea Plans to Stop a Nuclear Attack from North Korea,” *The National Interest*, July 10, 2017, <https://nationalinterest.org/blog/the-buzz/how-south-korea-plans-stop-nuclear-attack-north-korea-21472>.

25. “Chicago Summit Declaration,” North Atlantic Treaty Organization, press release 062, May 20, 2012, para. 58-59, [https://www.nato.int/cps/en/natohq/official\\_texts\\_87593.htm?selectedLocale=en](https://www.nato.int/cps/en/natohq/official_texts_87593.htm?selectedLocale=en); and “Warsaw Summit Communiqué,” North Atlantic Treaty Organization, press release 100, July 19, 2016, para. 54-60, [https://www.nato.int/cps/en/natohq/official\\_texts\\_133169.htm](https://www.nato.int/cps/en/natohq/official_texts_133169.htm).

## MANAGING ADVERSARIES

For ODI to contribute to deterrence, adversary decisionmakers must understand it and perceive it as capable and credible. The principal challenge in this regard will be to convince an adversary that new ODI capabilities will be more likely to deny it the benefits it seeks through military aggression.

The United States will have opportunities to shape those adversary perceptions in its public statements, published strategy and doctrine documents, and demonstrations of new capabilities. U.S. leaders will have to think through the most effective means of communicating ODI capabilities, the impact of those communications, and how it can most advantageously shape adversary responses. What capabilities to demonstrate, when, and to whom may be quite complicated in and of itself. For example, some of the non-kinetic means to which Admiral Greenert and General Odierno alluded can be quite sensitive and easily compromised. More broadly, demonstrating the effectiveness of integrated offense and missile defense systems may require changes to how the military tests and exercises them.

*For ODI to contribute to deterrence, adversary decisionmakers must understand it and perceive it as capable and credible.*

## WEAPONIZING SPACE

One policy debate that could recur here is that relating to the “weaponization” of space. Even while conceding the value of space-based military assets, many in the past have viewed space as a sanctuary, a domain in which countries should refrain from fighting or deploying offensive or defensive weaponry. Yet the United States may want to attack an enemy’s space-based sensors and communications with terrestrial or space-based systems as part of an effort to degrade the effectiveness of enemy missiles.

Likewise, the United States may wish to intercept targets in boost phase with space-based interceptors. Interceptors in space have been controversial in the past. This controversy has stemmed not from their defensive tasks but from their presumed offensive potential. From space, these interceptors could engage enemy space systems with very little warning time as well as missiles shortly after launch. In the past, this concern was enough to discourage serious consideration of basing systems in space.

## PREEMPTION

Another set of issues relates to considerations of “left of launch” and what U.S. forces would be permitted to do, against which enemy assets, and when. Some experts have expressed concern that left of launch equates to preemption and maintain that the United States should not be in the business of initiating military conflict.<sup>26</sup> The ODI concept will be problematic to many if the “offense” of ODI equates to preemption. Two factors mitigate this concern. First, in the context of an ongoing military conflict, left of launch is largely synonymous with offensive warfighting vice preemption. Second, the United States has left-of-launch options prior to military conflict that fall far short of what one would typically consider preemption. Non-kinetic actions against a variety of targets across the

---

26. The author has heard this contention personally from people who recently held high office in the current administration.

entire enemy kill chain (from manufacturing to sensors and C2) all have the potential to disrupt an attack. These actions all come at some risk of discovery, and the effectiveness of some would remain unknown until post-launch. The effects of these measures, however, always emerge *after* the enemy initiates military action.

*The ODI concept will be problematic to many if the “offense” of ODI equates to preemption.*

As in all military conflicts, potentially escalatory offensive actions involve policy judgments. After an initial enemy launch, the United States will have to consider guidelines on what, when, and how to engage enemy ballistic forces and their supporting capabilities. Attacking enemy space

sensors during a regional conflict could, for example, carry strategic nuclear risks. Those space sensors might also provide strategic warning. On the other hand, striking at sensors post-launch might be less escalatory than hitting launch sites in the enemy homeland.

## Doctrine

Joint doctrine describes command relationships and how forces pursue the goals laid out for them by the political leadership. It is written not to provide precise answers on how to achieve those goals in any specific tactical situation but rather as a common understanding of who is in charge and how they approach their tasks. The U.S. military has reams of doctrine, hundreds of documents covering all levels, types, and facets of warfare. With a more robust commitment to ODI, this doctrine would have to be revised. It will drive changes in all the other planning and preparation aspects of ODI.

### OFFENSE AND DEFENSE

Further insight comes from an examination of joint and service doctrines and how they treat and define offense and defense. Offense is regarded as decisive, while defense enables the offense. According to the Army, which devotes an entire book to how offense and defense are different, “The main purpose of the offense is to defeat, destroy, or neutralize the enemy force,” and its characteristics include “audacity, concentration, surprise, and rapid tempo.”<sup>27</sup> Defense, on the other hand, is “conducted to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive or stability tasks.”<sup>28</sup>

---

27. U.S. Army Headquarters, *Army Doctrine Publication 3-90: Offense and Defense* (Washington, DC: 2019), 7, [https://fas.org/irp/doddir/army/adp3\\_90.pdf](https://fas.org/irp/doddir/army/adp3_90.pdf).

28. U.S. Army Headquarters, *Army Doctrine Publication 3-0: Operations* (Washington, DC: 2019), 3-4, <https://fas.org/irp/doddir/army/adp3-0.pdf>. Such statements are common throughout U.S. doctrine. Doctrine for Joint Land Operations Command and Control, for example, includes sequential consideration of offensive and defensive operations. Offensive operations are considered to be decisive, creating a “cycle of deterioration” that can lead to the disintegration of enemy forces. On the other hand, “defense alone is normally not a decisive action,” but defensive operations “retain terrain, guard populations, and protect critical capabilities against enemy attacks and are used to gain time and economize forces so offensive tasks can be executed elsewhere.” Joint Chiefs of Staff, *Joint Publication 3-31: Command and Control for Joint Land Operations* (Washington, DC: 2014), IV-3, <https://www.hsdl.org/?abstract&did=752200>. Or elsewhere: “Defensive operations are combat operations conducted to . . . develop conditions favorable for offensive or stability operations. Defensive land control operations . . . protect critical capabilities against enemy attacks and are used to gain time and economize forces so offensive tasks can be executed elsewhere.” *Ibid.*, xvii.

Joint air and missile defense doctrine describes offensive counterair (OCA) operations similarly—offensive operations to defeat, destroy, or neutralize enemy air forces (including “enemy aircraft and missiles”) with the intent of defeating the enemy’s ability to inflict losses on U.S. forces. Doctrine explicitly includes virtually all kinds of U.S. forces, both offensive and defensive, in the pursuit of this goal. Generally, the purpose of OCA is to prevent the launch of threats by destroying enemy assets or disrupting some elements of the enemy kill chain. Defensive counterair (DCA) (including missile defense), on the other hand, is geared toward defeating or reducing the effectiveness of threats after they have launched. The doctrine calls for unity of effort through integration and synchronization of OCA and DCA in pursuit of the common goal of protecting U.S. forces. Nevertheless, “OCA and DCA are considered separate operations.”<sup>29</sup>

On the surface, current doctrine seems to provide excellent guidance on the integration of offensive and defensive forces. Yet both the 2019 MDR and the 2014 eight-star memo rest on the premise that ODI is lacking. Indeed, the level of integration and synchronization described in current doctrine does not appear to be fully implemented. This could be a failure of technology, in that the technology simply does not yet allow for such integration or perhaps the doctrine still misses the mark in communicating the level of integration required.

Current doctrine, while not heavily focused on the integration of offenses and defenses for the missile defeat mission, sometimes seems awkward in its consideration of the relationship of offenses and defenses. The awkwardness arises from three related factors.

First, implicit in the whole notion of ODI is the suggestion that distinctions between offense and defense are not conceptually so sharp. An operation to attack and neutralize an enemy missile force uses an offensive template to achieve a defensive goal. Perhaps the first step then in tying offense and defense together more tightly is to recognize that the operational concepts are not as distinct as previously considered.

A second issue is the difficulty of distinguishing them technologically. Many support functions are offense and defense neutral. Communications are communications, and sensors produce data potentially valuable for both offense and defense. The proximate purpose of an individual engagement is to interdict a target, be it an enemy soldier, tank, aircraft, reentry vehicle in space, or missile on the ground. From this perspective, every projectile is in some way an interceptor, be it a bullet, a tank round, or a missile defense interceptor. All can neutralize enemy capability and ensure the survival of U.S. forces.

Third, to the extent that the military successfully integrates, it will, at the level where forces engage in combat, stop thinking about differences between offense and defense. At the level of engagement, warfighters go through decision loops (observing, orienting, deciding, and acting) and shoot projectiles (nuclear, conventional, electronic, long-range, and short-range) with the goal of survival. Firing a projectile is not inherently offensive or defensive; offense and defense derive their meaning from broader context and goals. Engagements have always been time-compressed. But the evolution of the missile threat has led OSD and others to conclude battlefield survival requires that weapons that “attack”

---

29. Joint Chiefs of Staff, *Joint Publication 3-01*, 7.

and weapons that “protect” be used seamlessly. The purpose is not offense or defense, per se; the purpose is survival. At this engagement/execution level of conflict, offense and defense are perhaps more similar than not.<sup>30</sup>

LEVEL	GOAL:	OFFENSE	DEFENSE
Strategic		Impose Change	Protect the Status Quo
Operational/Theater		Initiative	Reaction and Shaping
Tactical		Attack	Protect
Engagement/Sub-engagement		Survival	Survival

This operational blurring between offense and defense may require new doctrinal language to describe the optimal ways of integrating strike and missile defense. “Proactive” or “initiative” operations and “reactive” operations might be such a construction. One can imagine, as an example, a “missile defeat engagement doctrine” that describes a unified set of actions to counter air and missile threats. Such a doctrine might start with intelligence and indications and warning provided by and supplied to all C2 levels and describe appropriate efforts anywhere in the lifespan of the threat to destroy or disrupt the threat. It might include, perhaps, a focus on the immediate exchange of data between systems that allow near-simultaneous engagement of shooter and warhead. While such language may or may not be an improvement over current doctrine, thorough ODI might require new vocabulary.

#### COMMAND AND CONTROL (C2)

Command is the authoritative establishment of intent and resource priorities. Control comprises the mechanisms that execute the command intent. Defining command and control (C2) relationships is an important function of doctrine, and the adoption of ODI would call for a review of C2.<sup>31</sup> Efforts to devise new and more effective C2 approaches are certainly not unique to ODI. Indeed, any such effort would seem consistent with broader efforts that have been ongoing for a couple of decades to adapt C2 approaches to demands of time-compressed, cross-domain conflict. At a minimum, more comprehensive ODI will require a thorough review of C2, and such a review will likely point toward C2 systems that do not much distinguish between offense and defense.

To date, air and missile defense planning has relied on centralized C2 and planning and decentralized execution. Complexity, however, is not always the friend of centralized planning, and much in the air and missile battle of the future would seem ideally suited to non-traditional C2. Those threats will change dynamically, adversary tactics and doctrine will not be not fully known, and attacks may come from unpredictable directions toward unexpected destinations. Traditional centralized C2 is not well suited to such threats; the higher the level of integration organizationally, the slower decisions are translated into local action, and the more likely that continuing operational seams will develop. An agile,

30. Tactical combat involves plans, maneuvers, and command—literally, tactics. I am using “engagement” here to connote a level below tactical—the actual act of combat (e.g. a tank shooting at a tank, a missile and an interceptor fired).

31. To clarify, this section does not deal with the more technically oriented processes of fire control, involving the collation and use of data to generate fire-control solutions for use by specific systems. That will be dealt with in the “Materiel and Acquisition” section.

responsive, resilient C2 system capable of adapting in near real time to the unknown would seem more appropriate. Further, decentralized C2 will be required to adapt and remain effective as battlefield losses degrade capabilities.

On the other hand, several factors suggest that decentralized C2 may not be a good fit for ODI.

One factor lies in the potential ramifications of delegating authority to carry out offensive strikes to lower levels of command. Shooting down a missile is one thing, and the command authority for self-defense would generally be quite clear. But if the goal is to use offensive and defensive forces seamlessly, command authority to use strike forces against the homeland of an enemy could set off an undesirable cascade of events.

Further, U.S. forces will likely be in battlespaces in which an adversary could pose threats simultaneously to the homeland, allies, the fleet (including locally to particular ships), airbases, and deployed ground forces. These engagements will likely compete for the same resources, sensors, communications, and shooters and will require effective resource prioritization within and throughout the chain of command.

This kind of complexity generates more pressing questions. Because engagements can be of strategic, theater, or tactical significance, little imagination is needed to see how command might skip an echelon or two down to ensure that resources required for a high-priority mission are available when needed. For instance, as U.S. Navy ships get more capable effectors integrated more tightly with defenses, how would command be parsed in very fluid circumstances that could result in escalation? Will command go down the chain in a straight line? Will command skip an echelon, with higher command exercising tactical control? Would lower levels of command ever be authorized to take actions (e.g., land attack that is now authorized by fleet command or higher) under certain circumstances (e.g., clear and present danger to high-value assets)?

Beyond these high-order questions, the military services may have to review specific C2 arrangements as offense and defense become more seamlessly exercised. For example, the Joint Maritime Operations Doctrine identifies strike operations and air and missile defense as two distinct warfare functional areas, each of which may have a functional commander.<sup>32</sup> The joint force maritime component commander functions at the operational level. Force operations are preplanned, and tactical commanders execute. The officer in tactical control (OTC) designates a composite warfare commander (CWC) who coordinates overall operations and “orchestrates operations to counter threats to the force.” At the same time, the OTC “retains close control of power projection and specific sea control operation.”

Consequently, offense and defense tend to fall under different tactical commands, and different capabilities onboard a given ship can come under different commanders. Would such command arrangements remain optimal? A C2 system that divides offense and defense would seem inconsistent with the goal of “the seamless use of offensive and defensive forces” to counter the missile threat, and so the answer would seem likely to be “no.”

---

32. Joint Chiefs of Staff, *Joint Publication 3-32: Command and Control for Joint Maritime Operations* (Washington, DC: 2018), II-12.



Similar considerations would hold for forces in other domains in a multi-domain battle. The Army organizes C2 in Combat Brigade Teams around the function (e.g., armor, infantry, artillery, air defense, or missile defense) and level (e.g., platoon, company, or battalion) of organic units. Revisiting this C2 arrangement, as well as Army organization, would seem almost inevitable if offenses and defenses were tied much more tightly. Will artillery units encompass both offensive and defensive artillery? How far down would operational control over the integrated offensive and defensive artillery extend?

Finally, combining C2 with that of other nations adds yet another layer of complexity. In any coalition, allies and partners function with goals that are not always identical with those of U.S. forces and sometimes with different rules of engagement. In the past, for example, Japan's military was unable, by national direction, to share information of sufficient quality for U.S. missile defenses to engage a missile threat. While Japan's rules of engagement have changed, adding an offensive component to the missile defeat mission would recreate a similar challenge of synchronizing two heteronomous C2 approaches.

All of this may boil down to an extraordinarily complicated question. How does one develop and evolve toward a C2 system capable of rapid self-synchronization, adapting quickly to changing threats, while allowing senior commanders to interject both intent and resource priority when needed, and do so across command structures, in multiple theaters, multiple domains, and multiple levels of warfare, all of which allows for the seamless, time-urgent use of offensive and defensive systems to counter the growing missile threat? Answering it is a tall order. There are probably no magic algorithms to produce a C2 system that supports true ODI, but it would probably require softening today's sharp distinctions between offense and defense.

### *Materiel and Acquisition*

Finally, the pursuit of ODI would also have a profound impact on materiel and the manner of its acquisition. Some of the technologies necessary to tie offenses and defenses together more tightly have proven challenging, with few fully mature today.

The state of these technologies will shape and be shaped by many of the other aspects of ODI. Any concept for the alignment and employment of military forces rests on a complex interaction of technology, doctrine, and organization. The art of the possible defines the limits of guidance on employment. Guidance on employment planning, in turn, provides insight into the need to develop new capabilities. ODI implies first and foremost that the state of technological art allows for such integration and will drive further development and acquisition.

### **FORCE STRUCTURE AND WEAPONS SYSTEMS**

A shift in how the military plans to address threats will naturally force a change in weapons and quantities. The authors of the eight-star memo explicitly called for alternative force structures with left-of-launch capabilities. Part of this examination would be to analyze the role of offenses and defenses in different phases of a campaign and the inventories required to support that role. How an integrated offense-defense approach to the missile defeat mission will impact quantities and types of weapons will depend on cost, effectiveness, and relevant concepts of operation.

The most difficult challenge in integrating offenses and defenses relates to battle management, command, control, and communications (BMC3) systems. BMC3 generally refers to the automated, man-in-the-loop systems that help commanders formulate plans, prioritize resources, issue commands, and control forces. These automated systems often receive intelligence data from multiple sources, try to provide a coherent and accurate battle picture, and offer courses of action. Finally, at the fire-control level, they find targets, calculate firing solutions, and often aim and fire weapons. Unsurprisingly, this is a very complex set of activities. Other complicating factors include:

- The growing diversity of missile threats;
- Challenges in threat detection and tracking these threats;
- Conversion of raw data into actionable information;
- Stove-piped system development, with incompatible protocols for the production, use, distribution, and receipt of information;
- Avoidance of friendly fire;
- Human involvement in the fire-control decision process; and
- The fog of war.

Unsurprisingly, these complexities have resulted in only limited success in BMC3 integration. The Army's Future Combat System (FCS) is a prime example. In the early-2000s, the Army envisioned FCS to develop a thoroughly networked system of systems comprising 18 new components. The program failed for a variety of reasons, but challenges with networking and C2 software were technical roadblocks.<sup>33</sup>

*The most difficult challenge in integrating offenses and defenses relates to battle management, command, control, and communications (BMC3) systems.*

Many integration efforts have focused on air defense, missile defense, and, in turn, integrated air and missile defense. In the missile defense arena, the Missile Defense Agency (MDA) long pursued the aspiration of “any sensor, any shooter” supported by efforts to develop an integrated system called Command and Control, Battle Management, and Communications (C2BMC). C2BMC supports BMD planning, provides a common threat picture, manages sensor resources, and supports secure connectivity. MDA has achieved some success over the past two decades by demonstrating the ability to share data from remote sensors, Aegis, and THAAD. On the other hand, Patriot and THAAD systems—both operated by the Army for many years—are only just now nearing the ability to talk to each other.<sup>34</sup>

---

33. Christopher G. Pernin et al., *Lessons from the Army's Future Combat Systems Program*, MG-1206-A (Santa Monica: RAND Corporation, 2012), 205-212, <https://www.rand.org/pubs/monographs/MG1206.html>. Active protection systems were also a serious challenge.

34. Adam Patterson, Matthew Becker, and Adam McGee, “THAAD, Patriot, and Avenger/ Sentinel interoperability within Guardian Battalion,” *Fires* (November-December 2018), 56-58, <https://sill-www.army.mil/firesbulletin/ar->

Integrated air and missile defense has been advocated and architected for many years by JIAMDOD, with modest resources and modest success. The Navy is perhaps the archetype for its limited realization. The Aegis Combat System has evolved from a fleet air defense system to a fleet air defense and missile defense to a complex integrated air and missile defense system and finally today to one that accommodates the multiple mission SM-6 and the Tomahawk cruise missile.

The Army is moving in this direction with the Integrated Air and Missile Defense Battle Command System (IBCS) program, which will integrate C2 for Patriot, Sentinel, and other air defense assets. IBCS is an open architecture C2 system, intended to provide a common air picture and optimize utilization of sensors and shooters by networking the system-of-systems, rather than merely linking them. IBCS has been in development since 2004 and has successfully achieved intercepts in several tests against air and ballistic missile targets.

The difficulty of integrating BMC3 in air and missile defense serves as a warning of how difficult fusing offensive and defensive systems will be. A BMC3 system fully integrating offenses and defenses would need to:

- Share data from an array of sensors; provide useful information to commanders at all levels and in all domains in near real time;
- Provide tactical decision assistance to those commanders (which shooters, in what order, and in which combination of offense and defense) and help those commanders deconflict competing priorities;
- Provide relevant threat data to both offensive and defensive systems; and
- Provide near-simultaneous fire-control solutions.

The result, a fully networked and integrated offensive and defensive missile defeat system, begins to sound a little god-like in capability. That suggests a sense of realism in near-term expectations. Even if the results are less than omniscience and omnipotence, research and development efforts would reduce the seams between the different tools to address the missile threat and minimize response times.

*Short of a revolutionary technical breakthrough, the path forward will be incremental.*

Short of a revolutionary technical breakthrough, the path forward will be incremental. The services nonetheless seem poised to proceed. As an open architecture system, IBCS has the potential to expand to incorporate offensive systems and counter-battery fire, and Army leadership has

described IBCS as the foundation for all Army fires. The Navy's NIFC-CA (Naval Integrated Fire Control-Counter Air) has achieved substantial success in fusing sensor data, optimizing sensor and interceptor use, and enabling over-the-horizon operations and

---

chives/2018/nov-dec/articles/18-6\_Nov-Dec\_web\_Patterson.pdf; see also Jen Judson, "So Patriot and THAAD will talk. What does that really mean?," *Defense News*, October 10, 2018, <https://www.defensenews.com/digital-show-dailies/ausa/2018/10/10/so-patriot-and-thaad-will-talk-what-does-that-really-mean/>.

has the potential to incorporate systems from the other services.<sup>35</sup> Truly joint and multi-domain integration of these systems, however, still seems far away.

### LAUNCHERS AND WEAPONS

Another path could involve combining offensive and defensive functions in common weapons systems, and recent technical developments may show a path to weapon systems that embody both offensive and missile defense functionality. At least five programs provide examples of this integration:

**Multi-mission missiles:** The SM-6 was born as an air defense missile for fleet defense, but it has evolved to provide the capability to intercept short- and medium-range ballistic missiles. In 2016, then-Secretary of Defense Ash Carter revealed the Navy had further modified the SM-6 to conduct surface-to-surface ship-attack missions. The same airframe can, therefore, both defeat threats after their launch and kill the threat platforms. Other systems might be similarly repurposed. The Common Glide Body developed for both the Army's Long Range Hypersonic Weapon and the Navy's Conventional Prompt Strike program could also conceivably be converted to a glide-phase hypersonic defense interceptor.

**Hypervelocity chemically-propelled shells:** Both the Navy and Army maintain substantial forces of large-caliber artillery, the Navy in its five-inch guns and Army in its 155-millimeter howitzers. The Navy has expressed interest in modifying its five-inch guns to shoot guided and maneuvering hypersonic projectiles that could be used for air and missile defense at ranges out to about 70 kilometers. The Army could apply similar technology to its howitzers. Such systems, which are not deployed nor in any program of record, could target threat systems right and left of launch and provide the ability to quickly choose a munition appropriate to the mission.<sup>36</sup>

**Electromagnetic railgun:** The Navy has shown interest in the electromagnetic railgun, which would use electromagnetic rails, rather than chemical propellants, to propel kinetic projectiles at speeds up to Mach 7 and ranges up to a couple of hundred kilometers. The original conception was to attack surface targets at longer range, but the Navy and MDA are exploring the technology for defensive applications. Again, precision maneuver and guidance would be key.

**Common launchers:** An avenue for closer strike and defense operations is through "effector agnostic" launchers with mixed offense/defense loads.<sup>37</sup> The idea of mixed-load launchers is not new; the Navy's Mark 41 Vertical Launching System has long fired both offensive and defensive missiles. But expanding the notion to ground forces and using

---

35. Alex Lockie, "The US Navy may have just figured out a way to save billions on bombs," Business Insider, February 23, 2017, <https://www.businessinsider.com/us-navy-nifc-ca-dumb-bombs-save-billions-2017-2>; and Anthony J. Behrens, "Joint Air and Missile Defense Mission Command: A Singular, Intelligent, Multidomain Platform and Culture," Paper submitted to the Navy War College, May 29, 2018, <https://apps.dtic.mil/dtic/tr/fulltext/u2/1057654.pdf>.

36. Sydney J. Freedberg, "\$86,000 + 5,600 MPH = Hyper Velocity Missile Defense," Breaking Defense, January 26, 2018, <https://breakingdefense.com/2018/01/86000-5600-mph-hyper-velocity-missile-defense/>.

37. Thomas Karako and Wes Rumbaugh, *Distributed Defense: New Operational Concepts for Integrated Air and Missile Defense* (Washington, DC: Center for Strategic and International Studies, 2018), <https://missilethreat.csis.org/distributed-defense-new-operational-concepts-air-missile-defense/>.

passive defenses to protect launchers is new. Such an approach might be challenging, but Russia's containerized Klub-K cruise missile already uses a similar deployment scheme.

**Active defenses for tactical platforms:** Aircraft have for decades deployed systems to protect themselves from surface-to-air or air-to-air to missiles, and similar concepts are being developed and deployed for ground vehicles. The Army is working to deploy the Modular Active Protection System (MAPS) for tanks and armored vehicles, which will intercept or divert incoming projectiles. Its modularity means users can adapt it to meet evolving threats. Israel, the United Kingdom, and Russia have also developed systems to protect vehicles, and the United States is also exploring systems to protect helicopters. These vehicles themselves embody both offensive and defensive capabilities and will be more survivable on the modern battlefield.

The United States is reportedly already developing the non-kinetic tools referenced in the Greenert/Odierno memo. Any weapon that could attack a missile in the various phases of its kill chain—interfering with logistics and maintenance, C2, communications, launch sequences, and sensors—could be a potentially valuable component of integrated offenses and defenses.

Leadership interest in ODI reflects a recognition of a military problem and some inkling that technologies central to ODI are promising enough today to pursue. If continued analysis and technology developments indicate that this kind of integration is a valid path to military advantage, requirements will reflect military desires, and the push for specific technology development will likely intensify. The future of ODI will, therefore, depend on how some of these complicated technologies evolve and mature.

## *Organization*

Organization touches and shapes everything the military does. Tight ODI would entail changes in how the military organizes itself.

### **OPERATIONAL ORGANIZATIONS**

Some cite U.S. Strategic Command (STRATCOM) as a good example of ODI at the strategic level. STRATCOM is a unified command that is responsible for strategic deterrence, global strike, and operating the Defense Department's Global Information Grid. STRATCOM also synchronizes missile defense plans, develops and prepares to execute deterrence and global strike plans, and conducts space operations. The command also combines offensive and defensive capabilities and supports C2 capabilities critical to such integration.

Nevertheless, STRATCOM's organization reflects clear distinctions between offenses and defenses. The Joint Force Component Command for Integrated Missile Defense (JFCC/IMD) synchronizes global, cross-regional missile defense planning and supports missile defense operations. The missions and functions of JFCC/IMD contrast with those of the Joint Force Air Component commander (also the commander of Air Force Global Strike Command) and Joint Forces Maritime Component commander (also the commander of Navy Fleet Forces Command), which are engaged in the planning and execution of strategic offensive operations.

The operational structures that best allow the effective pursuit of a fully integrated missile defeat mission, across multiple regional boundaries and multiple domains, remain to be determined. The limits of current doctrine, practice, technology, and military psychology may contribute to this. Several years ago, Rear Admiral Archer Macy (USN, Ret.) suggested the creation of a Missile Defense Command to conduct missile defense operations, as well as some offensive operations, in support of regional combatant command demands and to ensure that the capabilities were tested and exercised.<sup>38</sup> This idea remains controversial, as it would impinge on other established command relationships. The controversy could grow as ODI becomes broader and tighter. Nevertheless, as doctrine, practice, and technology evolve to reflect the need for ODI, responsive operational organizations are likely to evolve in parallel.

Among the services, the Navy seems to have an organizational construct that supports operational ODI. The experience has led to success in operating mature and large naval, air, and land forces. Ships function as a built-in unit that combines offensive and defensive functions, albeit through different offensive and defensive chains of command.

The Army, however, has further to go. Organizationally, the Army structures itself around the brigade combat team, which integrates smaller units (e.g., battalions and companies) of different types into a coherent fighting force. These types depend on the kind of brigade. An infantry combat brigade will include several infantry battalions supported by cavalry and artillery regiments and other support units of various sorts (e.g., communications, engineering, and logistics). Armor, artillery, and air and missile defense units are also organized at the brigade level. Offense and defense are thus integrated organizationally at higher headquarters. U.S. Army forces in Korea, for example, are organized in the 8th Army, which includes the 2nd Infantry Division (which has no organic air or missile defense units) and the 35th Air Defense Artillery Brigade.

At what organizational level the Army would integrate offenses and defenses would depend on doctrine and the maturity of the integrating technology. ODI at lower echelons could result in the elimination or redefinition of independent functional units. Separate field artillery and air defense artillery brigades could be merged. Multifunctional combat battalions combining multiple offensive and defensive capabilities at the battalion or battery level, however, would require additional technological development to achieve the optimal commonality in launchers, ordnance, and particularly fire-control technologies. Today, those systems remain incapable of linking weapons systems.<sup>39</sup>

#### **TRAINING ORGANIZATIONS AND PERSONNEL**

Services will have to reassess training and personnel structures in light of ODI. Will the Army train “air defenders” or “missile defenders” or even “field artillery” when common platforms

---

38. Archer Macy, “Full Spectrum Missile Defense” (remarks, Center for Strategic and International Studies, December 4, 2015).

39. For a sense of how the Army might integrate multiple defensive capabilities in a single unit, see: U.S. Army Space and Missile Defense Command, *Army Air and Missile Defense 2028* (Huntsville, AL: U.S. Army Space and Missile Defense Command, 2019), [https://www.smdc.army.mil/Portals/38/Documents/Publications/Publications/SMDC\\_0120\\_AMD-BOOK\\_Finalv2.pdf](https://www.smdc.army.mil/Portals/38/Documents/Publications/Publications/SMDC_0120_AMD-BOOK_Finalv2.pdf). The Army to date has not focused on multi-function units with offensive and defensive capabilities. See John P. Rafferty, “King of Battle: The Future of Long-Range Precision Fires” (remarks and interview, Center for Strategic and International Studies, Washington, DC, July 18, 2019), <https://www.csis.org/events/king-battle-future-long-range-precision-fires>.

launch both offensive and defensive systems? The Army Fires Center of Excellence at Fort Sill now combines air defense artillery and field artillery under a two-star commander. The goal of the center is to provide training, doctrine, requirements, and capabilities development to provide both offensive and defensive options to commanders. Nevertheless, field artillery and air defense artillery at the center are commanded separately by two brigadier generals.

### **ACQUISITION ORGANIZATIONS**

Acquisition organizations may have to be adapted, too. Today, the Navy generally develops and acquires offensive and defensive weapons through different organizations. Integrated Warfare Systems is primarily responsible for defensive systems, while NAVAIR focuses on offensive systems. Systems such as the SM-6—with both offensive and defensive missions—will pose a particular challenge to this construct.

If the Army develops common launchers and multi-mission missiles, it could have a similar acquisition challenge. Army research, development, and engineering centers (the Aviation and Missile Center, for example) are not, however, sharply divided between support of offensive and defensive systems. At the same time, many support systems such as communications and C2 seem offense-defense neutral. These will be the technical backbone of ODI if these systems both generate and comply with appropriate technical standards.

Another issue will be the relationship between the new Space Development Agency and the many services and OSD organizations involved in space acquisitions that support both the offensive and defensive aspects of missile defeat. As MDA further explores the potential of a space sensor architecture, the Army continues to develop Kestrel Eye (a highly distributed constellation of tactical low earth orbit, electro-optical sensors).

Perhaps the most significant acquisition issue relates to the authorities to coordinate “pre-launch” attack capabilities. The FY 2017 NDAA required the secretary of defense to designate, no later than March 2018, a service or defense agency with acquisition authority for pre-launch attack capabilities for missile defense.<sup>40</sup> OSD declined to do this, informing Congress in March 2020 that such capabilities are “diverse and distributed across the Department and Intelligence Community” and that these capabilities address multiple requirements beyond missile defeat.<sup>41</sup> Moreover, the 2019 MDR required senior DoD officials to recommend an organization to take lead responsibility for “attack operations capability development, employment concepts, and operational integration.”<sup>42</sup> DoD designated STRATCOM to “coordinate and advocate for pre-launch attack operations, doctrine, and operational concepts,” focused on trans-regional contingencies while leaving geographical combatant commands to lead regional operational planning and integration of left-of-launch capabilities in their respective areas of responsibility.<sup>43</sup> STRATCOM’s new responsibilities of “coordinate and advocate” would seem considerably short of the

---

40. National Defense Authorization Act for Fiscal Year 2017, Public Law 114-328, Section 1684.

41. Letter from USD/Research and Engineering Michael Griffin to Sen. James Inhofe, Chairman, Senate Armed Services Committee, March 3, 2020. Identical letters sent to the House Armed Services Committee and the Defense Subcommittees of the House and Senate Appropriations Committees.

42. OSD, *Missile Defense Review*, 63.

43. Griffin Letter to Sen. James Inhofe.

“lead responsibility” called for in the MDR. Whether this modest shift in organizational responsibilities will result in progress toward ODI remains to be seen.

A final, thorny issue is how to adapt MDA as the missile defense mission morphs from missile defense to missile defeat. MDA began with the mission of developing, acquiring, and deploying defenses against ballistic missiles. Ballistic missile defense remains a considerable challenge, but as the threat has expanded, MDA has started to address these other threats, most prominently for the defense against hypersonic glide vehicles. Inevitably, as the threat grows along with the consequent interest in ODI, the question as to the role MDA should play in this integration will be raised.

MDA already establishes an overarching architecture that guides its efforts on the defensive side. MDA is well versed in missile defense-related systems and integrated C2. A separate entity to develop and deploy offensive systems related to missile defeat seems not quite in the spirit of ODI. Key questions will be what offensive systems the United States should develop, who would be responsible, and how the missile defeat system of systems would be architected. How MDA would interface with and share responsibility with the services on these matters would also be significant. But while MDA has no particular expertise in strike systems, it has developed sensors and C2 systems that could help offensive systems engaged in missile defeat and would have to be integrated with those offensive systems.

Fairly radical possibilities on how to organize could be considered, both related to and beyond MDA’s role. One could be to transition MDA to unified command with responsibility for developing doctrine and equipping and training all forces responsible for defeating the missile threat. Such a role might be similar to that done by Special Operations Command (SOCOM) but on a smaller scale without operational responsibilities. Like SOCOM, a unified missile defeat command would retain special acquisition authorities for missile defeat-unique capabilities and systems, and the services would be responsible for all other offensive capabilities, including some quite relevant to, but not unique to, missile defeat.

Another possibility would be to fold all or some of MDA’s acquisition authorities into the new Space Force and the Space Development Agency that will come under the Space Force in 2022. Moving MDA space programs to the SDA, as has been proposed recently by DoD, could generate interest in moving the remaining MDA authorities to the other services.<sup>44</sup> Such an approach might encourage the services to better integrate missile defeat capabilities but would also seem counter to the inherently cross-domain, cross-service nature of ODI.

---

44. Theresa Hitchens, “MDA Future Debated as Space Force Rises,” *Breaking Defense*, March 27, 2020, <https://breaking-defense.com/2020/03/mdas-future-debated-as-space-force-rises/>.



# Conclusions

The obstacles to integrating offenses and defenses seem to be abating. The 2019 *Missile Defense Review* renewed past aspirations to more tightly tie together its offensive and defensive capabilities. Doctrine and programmatic advances of the past decade likewise provide the basis for hope.

But numerous questions and challenges remain. To say that ODI is highly desirable is not to say that it is easy or even achievable. The numerous references to integrating offense and defense simply indicate the view that more integrated forces could, in combination with many other factors, increase the overall survivability and effectiveness of U.S. forces. ODI gives them a better chance for victory than if they were not highly integrated. Absent attention to the breadth of considerations—doctrine, organization, training, materiel, and leadership—offense-defense integration will be more dream than reality.

If, on the other hand, Pentagon leaders remain committed to ODI to counter and defeat missile threats, they will have set the stage for a comprehensive and complicated review of virtually the entire landscape of U.S. deterrence, nuclear forces, and conventional warfighting. Hard questions remain ahead, but the time is ripe for their discussion.

## About the Author

**Brian R. Green** is a senior associate with the CSIS Missile Defense Project. Prior to his current post, Mr. Green served for over 30 years in a variety of government, industry, and association posts. Most recently, he was executive director of Washington operations at Aerojet Rocketdyne, with oversight and planning responsibilities for the company's defense business in the D.C. area. He also served as executive director for strategic force assessments at Systems Planning and Analysis, Inc., where he was responsible for the company's studies related to U.S. strategic forces and military space. From June 2005 to January 2009, Mr. Green was deputy assistant secretary of defense for strategic capabilities in the Office of the Secretary of Defense (OSD) for Policy. There he was responsible for policy formulation and oversight for strategic nuclear forces, long-range conventional strike, missile defense, military space, information operations, and strategic arms control. Prior to his OSD responsibilities, he served as the staff lead for the Strategic Forces Subcommittee of the Senate Armed Services Committee (2001-2004) and as the staff lead for strategic forces on the House Armed Services Committee (1997-2001), where he had oversight responsibilities for strategic forces, missile defense, military space, and the nuclear weapons complex. Mr. Green started his career in Washington with the Aerospace Education Foundation as managing director; the Air Force Association as chief of legislative research; and the Heritage Foundation as a defense policy analyst. He holds an MA in international relations from the University of Southern California.

---

**COVER PHOTO** AIR FORCE TECH. SGT. NED T. JOHNSTON

**CSIS** | CENTER FOR STRATEGIC &  
INTERNATIONAL STUDIES

1616 Rhode Island Avenue NW

Washington, DC 20036

202 887 0200 | [www.csis.org](http://www.csis.org)