

# REPORT DOCUMENTATION PAGE

*Form Approved*  
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. **PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.**

<b>1. REPORT DATE (DD-MM-YYYY)</b> 04-05-2009		<b>2. REPORT TYPE</b> FINAL		<b>3. DATES COVERED (From - To)</b>	
<b>4. TITLE AND SUBTITLE</b> Changing of the Guard: Restoring Regional Access Despite the Theater Ballistic Missile Threat				<b>5a. CONTRACT NUMBER</b>	
				<b>5b. GRANT NUMBER</b>	
				<b>5c. PROGRAM ELEMENT NUMBER</b>	
<b>6. AUTHOR(S)</b>  LCDR Christopher J. Polk, USN  Paper Advisor (if Any): N/A				<b>5d. PROJECT NUMBER</b>	
				<b>5e. TASK NUMBER</b>	
				<b>5f. WORK UNIT NUMBER</b>	
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b>  Joint Military Operations Department Naval War College 686 Cushing Road Newport, RI 02841-1207				<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>	
<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b>				<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b>	
				<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b>	
<b>12. DISTRIBUTION / AVAILABILITY STATEMENT</b> For Example: Distribution Statement A: Approved for public release; Distribution is unlimited.					
<b>13. SUPPLEMENTARY NOTES</b> A paper submitted to the Naval War College faculty in partial satisfaction of the requirements of the Joint Military Operations Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.					
<b>14. ABSTRACT</b>  Over the last decade, the threats to U.S. forces and allies from countries that can employ large quantities of theater ballistic missiles (TBMs) during regional, anti-access operations have increased significantly. TBMs threaten traditional US strengths of maritime dominance and air superiority while limiting power projection capabilities. This paper proposes the use of guided missile submarines (SSGNs) and low observable surface vessels (LOSVs) to restore access and provide sufficient time for force buildup during <i>phase II</i> operations before decisively engaging the enemy during <i>phase III</i> . It demonstrates that the application of operational art with the reliance on the principles of maneuver and concealment will enable theater commanders to deploy a countervailing strategy against the TBM threat and restore regional power balances. Finally, the paper draws conclusions concerning the effectiveness of current BMD systems during an anti-access campaign, and recommends a review of DOD's current "one shot, one kill" interceptor strategy and provides guidance for the best placement of theater interceptors.					
<b>15. SUBJECT TERMS</b> Theater Ballistic Missiles, Ballistic Missile Defense, Anti-Access operations, SSGN, OPLAN Phasing, Low Observable Surface Vessel					
<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b>	<b>18. NUMBER OF PAGES</b>	<b>19a. NAME OF RESPONSIBLE PERSON</b>
<b>a. REPORT</b> UNCLASSIFIED	<b>b. ABSTRACT</b> UNCLASSIFIED	<b>c. THIS PAGE</b> UNCLASSIFIED			Chairman, JMO Dept
				25	<b>19b. TELEPHONE NUMBER (include area code)</b> 401-841-3556

**NAVAL WAR COLLEGE  
Newport, R.I.**

**CHANGING OF THE GUARD: RESTORING REGIONAL ACCESS DESPITE THE  
THEATER BALLISTIC MISSILE THREAT**

by

**Christopher J. Polk  
LCDR, USN**

**A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.**

**The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.**

**Signature: \_\_\_\_\_**

**04 May 2009**

## Contents

Introduction	1
The Theater Ballistic Missile Environment	2
U.S. Military Fighting Doctrine	6
Theater Ballistic Missiles and the Future Battlespace	10
Counterargument	15
Conclusions	16
Recommendations	17
Bibliography	20

## Abstract

### *Changing of the Guard: Restoring Regional Access Despite the Theater Ballistic Missile Threat*

Over the last decade, the threats to U.S. forces and allies from countries that can employ large quantities of theater ballistic missiles (TBMs) during regional, anti-access operations have increased significantly. TBMs threaten traditional U.S. strengths of maritime dominance and air superiority while limiting power projection capabilities. This paper proposes the use of guided missile submarines (SSGNs) and low observable surface vessels (LOSVs) to restore access and provide sufficient time for force buildup during *phase II* operations before decisively engaging the enemy during *phase III*. It demonstrates that the application of operational art with the reliance on the principles of maneuver and concealment will enable theater commanders to deploy a countervailing strategy against the TBM threat and restore regional power balances. Finally, the paper draws conclusions concerning the effectiveness of current BMD systems during an anti-access campaign, and recommends a review of DOD's current "one shot, one kill" interceptor strategy and provides guidance for the best placement of theater interceptors.

## INTRODUCTION

“[Other nations are working on ways] to thwart the reach and striking power of the U.S. battle fleet...[by] developing anti-ship missiles with increasing range and accuracy. We ignore these developments at our own peril.”<sup>1</sup>

This recent statement by Secretary of Defense Robert Gates emphasizes the major challenges facing the U.S. military in the near future. Deployed U.S. and allied forces face a significant threat from countries that can employ large quantities of theater ballistic missiles (TBMs) during regional, anti-access operations. These adversaries deploy TBMs throughout their homelands in order to significantly offset regional power balances or limit U.S. ability to rapidly deploy forces for crisis response. In fact, carrier- and land-based airpower are so vulnerable to ballistic missile attacks that the U.S. would not have sufficient striking power to seize the initiative during *phase II* operations or provide sufficient time to buildup forces in theater before transitioning to *phase III* operations.

U.S. combatant commanders (COCOMs) need the capability to restore access, seize the initiative, and buildup sufficient force strength despite any regional TBM threats. SSGNs and low observable surface vessels provide the COCOMs with a revolutionary means to retake the initiative during phase II operations regardless of an enemy’s overwhelming ballistic missile capabilities. This paper will demonstrate that the application of operational art with the reliance on the principles of maneuver and concealment will enable the COCOMs to employ countervailing operations against the TBM threat and restore regional power balances.

---

<sup>1</sup> Christopher J. Castelli, “Warships Face New Vulnerabilities.” *Inside The Navy*, 20 April 2009, 6.

## THE THEATER BALLISTIC MISSILE ENVIRONMENT

### TBM Basics

TBMs are categorized by their effective ranges and such not be confused with cruise missiles. Short-range ballistic missiles (SRBMs) have an approximate range of 600 kilometers (about 324 nautical miles), medium-range ballistic missiles (MRBMs) have an approximate range of 1,300 kilometers (about 702 nm), intermediate-range ballistic missiles (IRBMs) have an approximate range of 5,500 kilometers (about 2,970 nm) and intercontinental ballistic missiles (ICBMs) have an approximate range of 10,000 kilometers (about 5,400 nm) or more.<sup>2</sup> Both TBMs and cruise missiles can carry either conventional or nuclear payloads and can be launched from air-, land-, or sea-based platforms. Some differences are that cruise missiles are propelled by jet engines at subsonic or lower supersonic speeds, fly at lower altitudes, have shorter ranges (<2,500km), and discriminate targets with onboard mapping programs or navigation systems, such as the Global Positioning System (GPS). Ballistic missiles are propelled by multi-stage rocket engines at supersonic speeds, travel to a predetermined position in space, and release payloads that gravity-fall from space to hit targets at ranges greater than 5,000 kilometers.<sup>3</sup>

Ballistic missiles can be difficult to destroy for a number of reasons. First, ballistic missiles travel at supersonic speeds and can only be destroyed by interceptor missiles capable of either matching or exceeding those speeds. Next, ballistic missiles can be equipped with maneuverable reentry vehicles (MaRVs) in order to hit moving targets (i.e., ships) or receive in-flight targeting data updates. Due to an ability to alter its terminal trajectory, MaRVs are

---

<sup>2</sup> Ronald O'Rourke. *Sea-Based Ballistic Missile Defense- Background and Issues for Congress* (Washington, DC: Congressional Research Service, 21 November 2008), CRS-46.

<sup>3</sup> The Claremont Institute, "What is a Ballistic Missile?" MissileThreat.com website. <http://www.missilethreat.com/overview/pageID.154/default.asp> (accessed 25 April 2009).

more difficult to intercept than normal reentry vehicles.<sup>4</sup> Lastly, ballistic missiles can be launched from quick reloading mobile launchers, or transporter erector launchers (TELs), that allow the enemy to conceal the missile before and after time of fire.

### Worldwide Acquisition Trends

The number of TBM test firings have grown steadily over the past decade with many different countries developing new missile prototypes, extending the ranges of existing inventories, and developing more advanced targeting and guidance systems.<sup>5</sup> As of 2006, at least 24 countries were known to possess TBMs and 12 countries were capable of producing missile technologies (see Figure 1). Although TBM proliferation occurs worldwide, this paper will only focus on the actions of one likely adversary—China.

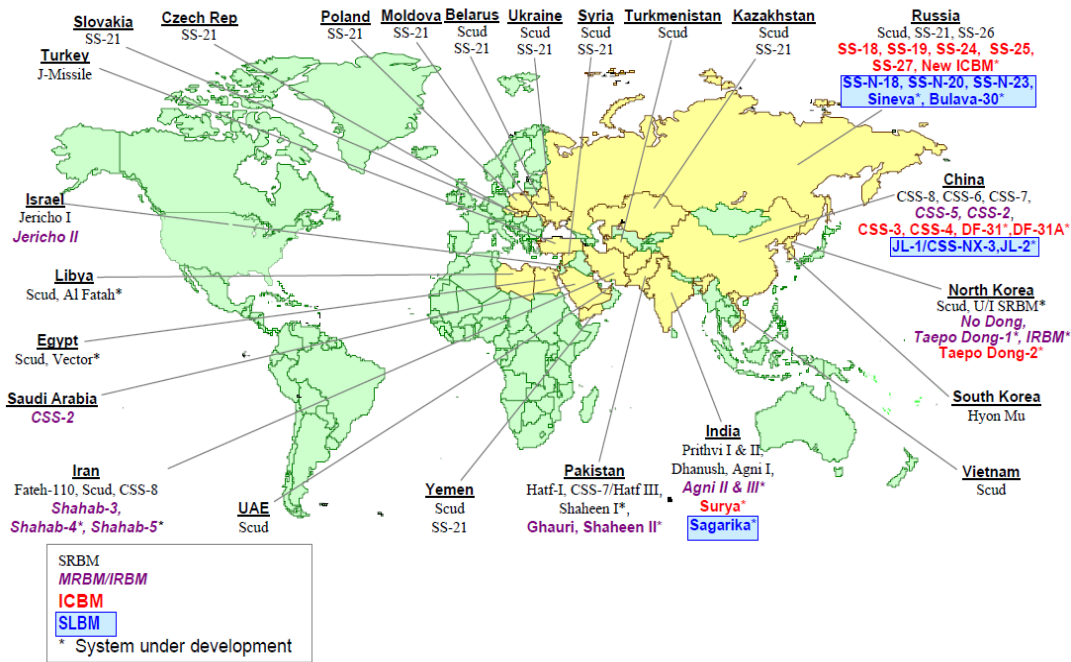


Figure 1 – Worldwide Ballistic Missile Capabilities<sup>6</sup>

<sup>4</sup> Ronald O'Rourke. *China Naval Modernization: Implications for U.S. Naval Capabilities- Background and Issues for Congress* (Washington, DC: Congressional Research Service, 19 November 2008), 3.

<sup>5</sup> U.S. Navy. Office of Naval Intelligence. *Worldwide Maritime Challenges* (Washington, DC: Department of the Navy, ONI, 2004) 20.

<sup>6</sup> Missile Defense Agency, "The Threat." Missile Defense Agency website. <http://www.mda.mil/mdalink/html/threat.html> (accessed 25 April 2009).

According to DOD reports, China has the most active ballistic missile construction and development programs in the world.<sup>7</sup> Although China is often criticized for its lack of transparency regarding defense expenditures and force sizes, there is no doubt that China’s aggressive modernization and buildup of its military forces includes TBMs.<sup>8</sup> China’s estimated land-based missile inventory is provided in Table I and SRBM production rates alone are believed to be 100 missiles per year. Analysts believe the TBM focus supports China’s strategic goals of establishing regional supremacy, conducting an anti-access campaign during a Taiwanese conflict, and threatening U.S. strategic assets worldwide. The effects of China’s TBMs on U.S. forces will be explored later in this paper.

Chinese Designation	NATO Desig	Class	Missiles	Range km)
Dong Feng 3	CSS-2	IRBM	10-15	3000+
Dong Feng 4	CSS-3	IRBM	10-15	5,400+
Dong Feng 5	CSS-4	ICBM	20	13,000+
Dong Feng 21	CSS-5	MRBM	60-80	1,750+
Dong Feng 15	CSS-6	SRBM	350-400	600
Dong Feng 11	CSS-7	SRBM	700-750	300
Dong Feng 31	CSS-9 Mod-1	ICBM	<10	7,200+
Dong Feng 31A	CSS-9 Mod-2	ICBM	<10	11,200+

Table I – China TBM Inventory<sup>9</sup>

### Status of U.S. Ballistic Missile Defense Systems

In 2002, the Missile Defense Agency (MDA) was established within the Department of Defense in order to “develop and field an integrated, layered, ballistic missile defense

<sup>7</sup> U.S. Department of Defense, *Annual Report to Congress: Military Power of the People’s Republic of China 2009* (Washington, DC: Office of the Secretary of Defense, 2009), 48.

<sup>8</sup>Information Office of the State Council of the People's Republic of China, *China's National Defense in 2008*, PRC Government White Paper. (Beijing, CH: Information Office of the State Council of the People's Republic of China, 2009) Section III.

<sup>9</sup> U.S. Department of Defense, *Annual Report to Congress: Military Power of the People’s Republic of China 2009* (Washington, DC: Office of the Secretary of Defense, 2009), 66.



system to defend the United States, its deployed forces, allies, and friends against all ranges of enemy ballistic missiles in all phases of flight.”<sup>10</sup> The MDA looks at three distinct phases of missile flight when developing their defense plans. The first phase, *boost*, occurs during the missile’s first 3 to 5 minutes of flight and up to an altitude of 300 miles. Interception during this phase is optimal because it limits the probability of decoy deployment and a greater earth surface area can be defended.<sup>11</sup> The MDA’s primary defense systems for this phase are the Airborne Laser (ABL) and Kinetic Energy Interceptor (KEI). ABL is an airborne laser system that directs its energy against missile casings until they are destroyed midflight. Secretary Gates recently recommended cutting funding for ABL and shifting the project to a research and development effort.<sup>12</sup> KEI is a ground or sea based system that uses a “high acceleration interceptor that delivers payloads capable of destroying adversary ballistic missiles and their lethal payloads using kinetic energy.”<sup>13</sup>

The second phase, *midcourse*, occurs when the missile has slowed to enter its glide path after initial thrusting is complete. The primary defense systems during this phase are the Ground Based Midcourse (GMD) interceptor and the AEGIS Ballistic Missile Defense. GMD utilizes land-based sensors and fire control radars in order to track ballistic missiles and launches a Ground Based Interceptor (GBI) with the capability to destroy LRBMs in space. The AEGIS BMD system is based on AEGIS fire control and SPY-1 radar systems found onboard Navy cruisers and destroyers. AEGIS either uses standard missile (SM) variants to intercept short- and medium-range ballistic missiles or relays targeting

---

<sup>10</sup> Missile Defense Agency, “MDA Mission.” Missile Defense Agency website. <http://www.mda.mil/mdalink/html/aboutus.html> (accessed 25 April 2009).

<sup>11</sup> Missile Defense Agency, “Boost Phase Defense.” Missile Defense Agency website. <http://www.mda.mil/mdalink/html/boost.html> (accessed 25 April 2009).

<sup>12</sup> The Claremont Institute, “Gates Announces New Defense Budget Plans.” MissileThreat.com website. <http://www.missilethreat.com/> (accessed 25 April 2009).

<sup>13</sup> Missile Defense Agency, “KEI Fact Sheet.” Missile Defense Agency website. <http://www.mda.mil/mdalink/pdf/kei.pdf> (accessed 25 April 2009).

information to ground-based BMD systems. Both the GMD and AEGIS systems are based on proven technologies, have tested successfully numerous times, and continue to receive funding support.<sup>14,15,16</sup>

The third phase, *terminal*, refers to when the warhead falls back to earth and this phase can last up to one minute. The major systems employed during this phase are the PATRIOT Advanced Capability (PAC-3) system and the Terminal High Altitude Area Defense (THAAD) system. The PAC-3 system, operational since 2003, uses an explosive fragmentation warhead to destroy incoming missiles and is also a critical component of the Army's future Medium Extended Air Defense System (MEADS). MEADS is a short-range, point defense system that uses PATRIOT missiles and an advanced C2 network to destroy ballistic missiles, cruise missiles, unmanned aerial vehicles, etc.<sup>17</sup> THAAD is designed to destroy SRBMs and MRBMs at long ranges and high altitudes by using *hit-to-kill* interceptor technology. The MDA's concept of operations is to deploy THAAD together with PAC-3 to provide BMD capabilities to any region as required. Secretary Gates has recommended increasing the funding for THAAD.

## **U.S. MILITARY FIGHTING DOCTRINE**

For decades after the Viet Nam conflict, the U.S. military struggled to incorporate the lessons learned from this humbling experience into its fighting doctrine. Viet Nam was marred by a lack of unity of effort among the services, a sporadic air campaign, gradual troop

---

<sup>14</sup> Associated Press. "U.S. Missile Defense Sensor Test Called Successful." *SF Gate*, 18 July 2008. <http://www.sfgate.com/cgi-bin/article.cgi?f=/n/a/2008/07/18/state/n190106D92.DTL> (accessed 25 April 2008).

<sup>15</sup> Missile Defense Agency, "Missile Defense Flight Test Results in Successful Intercept." Missile Defense Agency website. <http://www.mda.mil/mdalink/pdf/08news0090.pdf> (accessed 25 April 2009).

<sup>16</sup> U.S. Third Fleet Public Affairs. "Navy Completes Air and Ballistic Missile Exercise." *U.S. Navy Official website*, 27 March 2009. [http://www.navy.mil/search/display.asp?story\\_id=43808](http://www.navy.mil/search/display.asp?story_id=43808) (accessed 25 April 2008).

<sup>17</sup> Missile Defense Agency, "PAC-3 and MEADS Fact Sheet." Missile Defense Agency website. <http://www.mda.mil/mdalink/pdf/pac3meads.pdf> (accessed 25 April 2009).

buildups, and open-ended operations without clear military objectives.<sup>18</sup> The two most influential figures during Operation DESERT STORM in the early 1990s were General Norman Schwarzkopf (CENTCOM and the Joint Force Commander) and General Colin Powell (Chairman of the Joint Chiefs of Staff). Having experienced the Viet Nam failures firsthand, their decision-making and campaign planning for DESERT STORM sought to correct these failures and ensure a decisive military victory. The basic framework of the DESERT STORM campaign plan—prevent further aggression with a limited forces, conduct major air operations against enemy critical capabilities while building force strength, engage the enemy in decisive offensive operations, and transition to war termination—has become the basis for notional operational plans, or the way the U.S. military fights wars (see Figure 2).

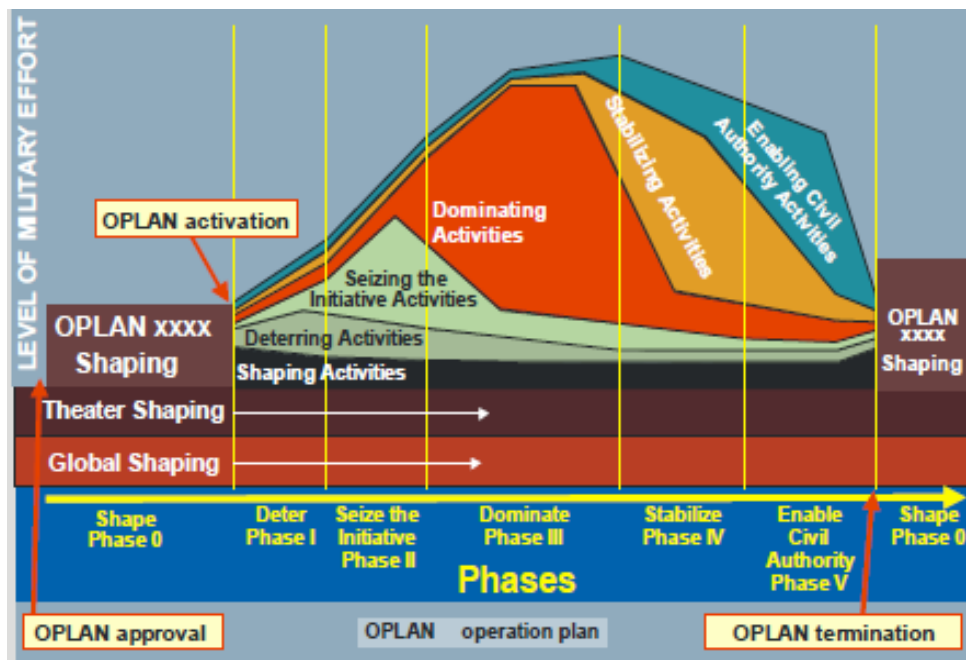


Figure 2 – Notional Operational Plan Phases<sup>19</sup>

<sup>18</sup> Michael R. Gordon and Bernard E. Trainor, *The Generals' War: The Inside Story of the Conflict on the Gulf* (Boston, MA: Little, Brown and Company, 1995), viii-xi.

<sup>19</sup> Chairman, U.S. Joint Chiefs of Staff, *Joint Operations*, Joint Publication (JP) 3-0 (Washington, DC: CJCS, 13 February 2008), IV-26.

Current U.S. joint doctrine defines six possible phases that can be utilized by the Joint Force Commander (JFC) for campaign or operational plans (OPLAN).<sup>20</sup> Although these phases can occur simultaneously, they are designed to be sequenced and the JFC is expected to include various conditions or objectives that must be met in order to transition between the phases. The initial phase, *phase 0 (shape)*, includes “shaping perceptions and influencing the behavior of both adversaries and allies, developing allied and friendly military capabilities for self-defense and coalition operations, improving information exchange and intelligence sharing, and providing U.S. forces with peacetime and contingency access.”<sup>21</sup> The phase goals are to deter potential conflicts before they arise and enhance relationships with allies should efforts fail to prevent escalation. *Phase I (deter)*, is composed of actions designed to display the combat capabilities of the U.S. military while further demonstrating the commitment of the joint force to deterring the adversary. Actions in this phase are designed to prepare the battlespace for future offensive operations or courses of action (COAs).

The thesis of this paper focuses primarily on the U.S. military operations during the next two phases (*phase II and III*) against an adversary with a large BMD capability. *Phase II (seize the initiative)* is designed “to gain access to theater infrastructure and to expand friendly freedom of action while the JFC seeks to degrade adversary capabilities with the intent of resolving the crisis at the earliest opportunity.”<sup>22</sup> By starting offensive operations early, the JFC can hedge current capabilities against further enemy aggression and force them

---

<sup>20</sup> Ibid., IV-27-IV-30.

<sup>21</sup> Chairman, U.S. Joint Chiefs of Staff, *Joint Operational Planning*, Joint Publication (JP) 5-0 (Washington, DC: CJCS, 26 December 2006), IV-35.

<sup>22</sup> Ibid., IV-37.

into a defensive posture. The phase goals are to expand freedom of maneuver, gain control of key infrastructure, and establish conditions for success during the next phase. *Phase III (dominate)* focuses on “breaking the enemy’s will for organized resistance or, in noncombat situations, control of the operational environment.”<sup>23</sup> During this phase, the true nature of war, as defined by noted military strategist Carl von Clausewitz, is realized: “*War is thus an act of force to compel our enemy to do our will.*”<sup>24</sup> The JFC armed with the full combat power of all assigned forces engages the adversary in order to compel them to accept U.S. political objectives. At the end of this phase, operations may cease and the transition to post-conflict activities will begin.

Lastly, the point of any military operational plan is to achieve the political objectives shaped by the country’s strategic documents, such as the National Security Strategy (NSS), National Defense Strategy (NDS), and the National Military Strategy (NMS). The terminating operations started in *phase IV (stabilize)* and continued in *phase V (enabling the civilian authority)* are essential to these efforts. *Phase IV* involves the full range of stability operations starting with immediate assistance in constabulary duties, basic security, social services, and humanitarian assistance. *Phase V* involves the actual transfer of governance, basic social, and security services back to a legitimate civilian authority. Military forces are in a more supportive role and some combat troops will begin the redeployment process from the theater as the OPLAN concludes.

---

<sup>23</sup> Joint Publication (JP) 3-0, *Joint Operations*, IV-29.

<sup>24</sup> Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976),75.

## **THEATER BALLISTIC MISSILES AND THE FUTURE BATTLESPACE**

Although the DOD is concerned about the TBM capabilities of many countries and non-state actors, it is primarily concerned with China. The DOD's 2006 Quadrennial Defense Review stated that China "has the greatest potential to compete militarily with the United States and field disruptive military technologies and could over time offset traditional U.S. military advantages."<sup>25</sup> Experts believe that China has focused on developing forces that can "succeed in a short-duration conflict with Taiwan and act as an anti-access force to deter U.S. intervention or delay the arrival of U.S. forces, particularly naval and air forces, in such a conflict."<sup>26</sup>

During a recent maritime security conference sponsored by the Center for Strategic and Budgetary Assessments (CSBA), panelists discussed disturbing trends witnessed during numerous war game scenarios involving near peer competitors (NPCs), such as China, conducting anti-access campaigns. Officials noticed that U.S. surface vessels, including aircraft carriers, were becoming more susceptible to anti-access and area denial tactics by NPCs. Retired Navy captain and CSBA senior fellow, Jan van Toal commented, "...the big lesson we're drawing from these game series is that long-time U.S. assumptions [of] maritime dominance, rapid operational timelines and short wars that we all seemed to be used to until recently need ongoing reassessment."<sup>27</sup> Toal also believes that an NPC's increased inventories and improved capabilities of ASBMs, ASCMs, and submarines would

---

<sup>25</sup> U.S. Department of Defense, *Quadrennial Defense Review Report* (Washington, DC: Office of the Secretary of Defense, 6 February 2006), 29.

<sup>26</sup> O'Rourke, "China Naval Modernization: Implications for U.S. Naval Capabilities- Background and Issues for Congress," 1.

<sup>27</sup> Rebekah Gordon, "CSBA War Games: Area Denial, Sub Forces Could Defy U.S. in the Pacific." *Undersea Enterprise News Daily*, 20 April 2009, 12.

force U.S. carriers to operate outside effective missile ranges and so far from land that “...potentially carriers might not be relevant to the fight, at least early in the campaign.”<sup>28</sup>

The critical component of the Chinese anti-access campaign is the large inventory of TBMs deployed on both fixed and mobile launchers. There are an estimated 1050-1150 SRBMs, supplemented by MRBMs and ASBMs, in the Nanjing military region on the coast of the Taiwan Straits alone.<sup>29</sup> The Chinese could hold large surface ships and aircraft carriers at risk by simultaneously launching massive quantities of TBM in an attempt to saturate an operating area. Saturation launches would serve a two-fold purpose of overwhelming any U.S. BMD capabilities while providing the capability of destroying all moving targets within that area. Most TBMs are launched at fixed locations and not at maneuvering targets because they cannot adjust their trajectories midflight (unless they possess MaRV technologies). DOD reports further indicate that the Chinese are also developing an over-the-horizon (OTH) targeting capability using Sky Wave radar systems and other C4ISR systems.<sup>30</sup> OTH targeting is still not a proven capability of the Chinese, but once demonstrated it would serve to localize the carrier operating area for TBM launches and provide MaRV warheads with updated targeting data in-flight.

The Chinese could also employ TBMs to strike U.S. air bases or logistical hubs in the region. The loss of land-based air from places such as Kadena or Guam would significantly degrade the U.S. ability to gain control of the airspace and conduct precision strikes. Both of these air bases support several Air Force air wings and Navy squadrons capable of conducting a wide range of missions from precision strike to intelligence and cargo lift. The

---

<sup>28</sup> Ibid.

<sup>29</sup> U.S. Department of Defense, *Annual Report to Congress: Military Power of the People's Republic of China 2009* (Washington, DC: Office of the Secretary of Defense, 2009), VIII.

<sup>30</sup> Ibid., 20.

loss of either logistical hubs or Military Sealift Command's (MSC) prepositioned assets would greatly increase the time required to build up sufficient force strengths in theater to respond to regional threats. During both Operation ENDURING FREEDOM and IRAQI FREEDOM, the bulk of armored equipment and other combat gear was delivered by MSC prepositioning ships.<sup>31</sup> The destruction of either air bases or logistical assets could also limit the possible COAs available to COCOM.

What about current U.S. initiatives to counter the BMD threat in a regional anti-access scenario against a NPC? In a Taiwan Strait scenario, the only operational assets likely available to the COCOM are AEGIS BMD surface ships and PAC-3 batteries. An adversary with an overwhelming number of TBMs could easily track and target these assets with missiles or use its submarine and surface navies to hunt down AEGIS platforms. Also, the adversary could track the movements of AEGIS platforms during pre-hostilities and develop COAs that attack them as part of the initial phase of the battle. Although PAC-3 launchers are mobile, they are still vulnerable to saturation launches and these locations could easily be compromised by Chinese intelligence networks.

If an adversary's strategy is to deny the U.S. traditional advantages of airpower and logistical capabilities early in the conflict, what countervailing strategies are available to the COCOM to restore access, seize the initiative, and buildup sufficient force strength despite any regional TBM threats? SSGNs and low observable surface vessels provide the COCOMs with a revolutionary means to retake the initiative during *phase II* operations regardless of an enemy's overwhelming ballistic missile capabilities.

---

<sup>31</sup> Military Sealift Command, "Prepositioning." Military Sealift Command website. <http://www.msc.navy.mil/pm3/> (accessed 25 April 2009).



Low observable surface vessels (LOSVs) are any surface platform that has stealth capabilities designed into its superstructure with either shapes that have limited radar cross-sections or radar absorbing materials. The U.S. Navy has already incorporated low observable technologies into four *San Antonio* class amphibious transport dock ships (LPD) and two Littoral Combat Ships (LCS) and plans to do the same on the next generation destroyers (DDG-1000). In their current configurations, the LPDs and LCSs are not capable of firing cruise missile or BMD interceptors and are offered only as future options and to demonstrate that low observable technologies exist in the fleet. This paper will focus instead on guided missile submarines (SSGNs), but most arguments are transferrable to LOSVs.

SSGNs are converted Trident-class ballistic missile submarines that have 22 missile tubes capable of firing a total of 154 Tomahawk cruise missiles and 2 missile tubes converted for deploying special operations forces. The four SSGNs that exist in the fleet today are capable of covering the majority of theater strike packages thereby allowing surface ships to conduct other missions.<sup>32</sup> What enables a SSGN to be so lethal in an anti-access campaign are its inherent capabilities of concealment and maneuver.

Maneuver is one of the nine principles of war and is defined as “the movement of forces in relation to the enemy to secure or retain positional advantage, usually in order to deliver— or threaten delivery of — the direct and indirect fires...”<sup>33</sup> In a TBM anti-access campaign, there will be certain areas of the battlespace that will not be available for surface combatants or aircraft to operate freely due to the adversary’s missile ranges, radar detection capabilities, patrol areas, etc. Freedom of maneuver is desired by the COCOM to ensure that friendly forces are in a position to attack the enemy’s center of gravity or are available for

---

<sup>32</sup> Ronald O’Rourke. *Navy Trident Submarine (SSGN) Conversion Program- Background and Issues for Congress* (Washington, DC: Congressional Research Service, 22 May 2008), 4.

<sup>33</sup> Joint Publication (JP) 3-0, *Joint Operations*, A-2.

decisive operations whenever required. The *Joint Operations Manual* lists additional benefits of maneuver as “...keeps the enemy off balance and thus also protects the friendly force...reducing vulnerability by continually posing new problems for the enemy.”<sup>34</sup>

Concealment, or stealth, is the ability of the SSGN to remain submerged and undetected for long periods of time due to the advantages of nuclear power and sound silencing practices. Concealment is the critical factor in providing a countervailing strategy to a TBM anti-access campaign. A TBM anti-access campaign tries to overwhelm the U.S. air and surface forces with a massive quantity of missiles, most of which can be considered survivable because they are launched from mobile TELs. If the U.S. cannot overcome these effective anti-air and anti-surface defenses, then it cannot quickly project enough power to halt the enemy’s offensive or influence its actions. In short, the credibility of the U.S. to provide an “umbrella of protection” for its allies and its status as a superpower are at stake. SSGNs provide a countervailing strategy to the COCOM because the adversary is forced to account for the significant risks to its forces from an undetectable and survivable asset. In essence, the SSGNs are a deterrent from conventional missile strikes much the same way they were from nuclear missile strikes. If both sides are not reasonably certain they can destroy the other’s forces without their own forces also being destroyed, then it is pointless to fight at all. Creating a *mutually assured destruction* (MAD) scenario is the goal of this countervailing strategy.

SSGNs provide the COCOM with two possible COAs for an aggressive, anti-access campaign with a NPC. First, SSGNs could conduct a preemptive strike if diplomatic solutions cannot be realized and neutralize as many TBM TELs, fixed launch sites, and C4ISR structures as possible. Due to a submarine’s inherent ability to arrive in theater and

---

<sup>34</sup> Ibid.

take station close to an enemy's coast, strike missiles would be launched from shorter ranges and be able to destroy targets quicker. The enemy would have less time to respond or move critical assets to safer locations. Secondly, during the *trans-attack* phase SSGNs equipped with a mixture of interceptors and hypersonic cruise missiles would not only permit the destruction of launched TBMs, but also the destruction of TELs and launch sites before they could be reloaded or concealed. The unique abilities to neutralize both the immediate and follow-on threats are due to the SSGN's proximity to enemy launchers and the high speed cruise missiles.

### **COUNTERARGUMENT**

Critics of a SSGN BMD program could argue that the platform's major weakness is the inability to target TBMs with onboard sensors. On the contrary, the SSGN's reliance on external sensors for interceptor data is actually a strength that not only enhances its survivability, but also improves its probability of interception. Since SSGNs do not need to operate high-power radar suites to track TBM flight paths, they will not emit significant electromagnetic radiation that could be counter-detected by an adversary. A limited electromagnetic signature, allows SSGNs to operate much closer to launch sites than AEGIS platforms thus increasing the probability of intercepting TBMs during early ballistic flight trajectories (i.e., between the boost and initial midcourse phases). Early interception during these phases is both preferred and easier because TBMs do not usually deviate from flight paths or deploy decoys as they travel to their predetermined positions in space.

AEGIS BMD platforms are already capable of launching interceptors *on remote*, or with external targeting data, by utilizing the Cooperative Engagement Capability (CEC)

software program.<sup>35</sup> CEC extends the effective coverage of a missile defense system by incorporating sensor data from all ships in the network. There is no reason why this existing technology could not be installed on SSGNs to allow them to launch interceptors with AEGIS radar data. Also, the Navy is currently developing a more advanced integration program known as Naval Integrated Fire Control – Counter Air (NIFC-CA). NIFC – CA would synthesize sensor data from all Navy surface and air platforms (and possibly from other services) in order to provide a common tactical picture complete with targeting information.<sup>36</sup> The concept of operations envisioned for SSGN BMD platforms is to combine NIFC-CA remote targeting capability with fused, space-based sensor data to provide initial guidance and placement of interceptor missiles against early trajectories of hostile ballistic missiles. Initial placement of interceptors closer to the trajectories of their targets will result in higher success rates.

## CONCLUSION

For several decades, the aircraft carrier has been the primary U.S. means of projecting worldwide power and providing credible support for allies. During conflicts, carrier air wings provided the U.S. military with enough force during *phase II* operations to halt initial enemy advances and provide sufficient time to buildup forces in theater before transitioning to decisive *phase III* operations. Today, NPCs armed with massive TBM inventories are a credible threat to a carrier's survivability during a regional, anti-access campaign. SSGNs and LOSVs provide the COCOMs with a revolutionary means to retake the initiative during *phase II* operations regardless of an enemy's overwhelming ballistic missile capabilities. It is

---

<sup>35</sup> Richard Burgess, "Broader Shield: Navy Hones the NIFC – CA to Improve Its Prowess in the Outer-Air Battle," *Seapower*, March 2007, 32.

<sup>36</sup> *Ibid.*

the inherent capabilities of maneuver and concealment, that permit SSGNs and LOSVs to operate freely within the battlespace and provides a credible countervailing strategy to any TBM anti-access campaign. The U.S. can continue to provide overwhelming capabilities in order to deter a NPC from taking offensive actions against U.S. interests.

## **RECOMMENDATIONS**

One of the biggest obstacles to overcome in a TBM-based, anti-access campaign is the sheer volume of missiles that can be employed against U.S. forces. Regardless of any technological improvements to interceptor missiles such as the SM3-Block IIA, the concept of using one interceptor per threat missile is inherently flawed and must be reconsidered by the National Command Authority. As a NPC makes advancements in missile technologies, the U.S. would be forced to counter the new threat, thereby initiating an endless action-reaction cycle. Even if it was possible to build a significant inventory of interceptor missiles, they are generally two to three times more expensive than the missiles they are designed to kill.<sup>37</sup> A “one shot, one kill” BMD policy will ultimately lead to another Cold War style arms race that provides insufficient TBM protection and is fiscally irresponsible. One alternative is to reconsider the recent cancellation recommendation for the Multiple Kill Vehicle (MKV) program. MKVs were designed to fit on GBI, KEI, or SM-3 missiles and would permit single interceptors to destroy multiple threat missiles. Therefore, the U.S. could build fewer interceptors and still provide a credible BMD strategy.

Secondly, DOD should refit SSGNs with SM-3 interceptor launch capabilities. Given the inherent advantages of concealment and maneuver discussed earlier in this paper, SSGNs

---

<sup>37</sup> U.S. Congressional Budget Office, *Long Term Implications of Current Defense Plans: Summary Update for Fiscal Year 2008* (Washington, DC: Congress of the United States, December 2008), 24.

are the most survivable and easily deployable options for theater-wide BMD. Therefore, placing the primary BMD interceptor on a SSGN assures that these crucial assets will be available to the COCOM despite a possible first strike by the adversary. SSGNs are already capable of precision strike and could easily launch interceptors *on remote* with external sensor information. Sensors such as space-based infrared systems (SBIRS), defense support program satellites, Sea-based X-Band radars are considered survivable and could provide the required targeting data during post-launch. Separating interceptors from targeting sensors also forces the adversary to destroy multiple targets in order to neutralize US BMD capabilities.

Next, DOD should reconsider its plan of placing all theater interceptors on large ships. These ships will always be targets from any nation seeking to conduct an anti-access campaign and de-legitimize U.S. regional influence. Terrorist attacks on the *USS Cole* showed how devastating even a crude explosive device could be to a surface ship's operability. Additionally, many nations already have capable submarine forces which due to their stealth and undersea environmental factors may be able to attack AEGIS BMD ships with little or no warning. In order to improve survivability of the BMD interceptors, they should also be placed on LOSVs. The best BMD-capable LOSV would be a relatively small size, high-speed vessel similar to a *Cyclone*-class Patrol Craft (180ft, 35 kts). Having many of these fast and maneuverable boats creates an accountability problem for an adversary and forces them to expend expensive assets in an attempt to counter a much cheaper target.

Lastly, despite ongoing operations in Afghanistan and Iraq, the DOD cannot neglect preparations for future conflicts. Secretary Gates has insisted that this will not happen, yet he

has recommended \$1.4 billion in budgetary cuts for the MDA.<sup>38</sup> There are too many unfriendly nations aggressively funding TBM acquisition programs and researching improved missile technologies to neglect this problem. Now and in the future, TBMs are a serious threat to U.S. strategic access and the ability to influence the actions of other nations. BMD programs are critical enablers of national strategic policy and as such must be properly funded.

---

<sup>38</sup> The Claremont Institute, "Gates Announces New Defense Budget Plans." MissileThreat.com website. <http://www.missilethreat.com/> (accessed 25 April 2009).

## BIBLIOGRAPHY

Associated Press. "U.S. Missile Defense Sensor Test Called Successful." *SF Gate*, 18 July 2008. <http://www.sfgate.com/cgi-bin/article.cgi?f=/n/a/2008/07/18/state/n190106D92.DTL> (accessed 25 April 2008).

Burgess, Richard. "Broader Shield: Navy Hones the NIFC – CA to Improve Its Prowess in the Outer-Air Battle." *Seapower*, March 2007, 32-33.

Carr, Nevin. "Surface Ship Combat Systems Outlook." Powerpoint. 25 April 2006.

Castelli, Christopher J. "Warships Face New Vulnerabilities, Defense Secretary Warns." *Inside The Navy*, 20 April 2009, 6.

Castle, Mandy. "IHS Jane's Examines What the Failure of North Korea's Satellite Launch Means." *Jane's Defence Weekly*, 6 April 2009.  
[http://www.janes.com/media/releases/pc090406\\_1.shtml](http://www.janes.com/media/releases/pc090406_1.shtml) (accessed 27 April 2009).

The Claremont Institute, "Gates Announces New Defense Budget Plans." MissileThreat.com website. <http://www.missilethreat.com/> (accessed 25 April 2009).

The Claremont Institute, "What is a Ballistic Missile?" MissileThreat.com website. <http://www.missilethreat.com/overview/pageID.154/default.asp> (accessed 25 April 2009).

Clausewitz, Carl von. *On War*. Edited and translated by Michael Howard and Peter Paret. Princeton, NJ: Princeton University Press, 1976.

Gates, Robert. "Defense Budget Recommendation Statement." 6 April 2009.  
<http://www.defenselink.mil/speeches/speech.aspx?speechid=1341> (accessed on 25 April 2009).

Gordon, Michael R., and Bernard E. Trainor. *The Generals' War: The Inside Story of the Conflict on the Gulf*. Boston, MA: Little, Brown and Company, 1995.

Gordon, Rebekah. "CSBA War Games: Area Denial, Sub Forces Could Defy U.S. in the Pacific." *Undersea Enterprise News Daily*, 20 April 2009, 12.

Independent Working Group. *Missile Defense, the Space Relationship, and the Twenty First Century*. Washington, DC: The Institute for Foreign Policy Analysis, Inc., 2009.

Information Office of the State Council of the People's Republic of China. *China's National Defense in 2008*. PRC Government White Paper. Beijing, CH: Information Office of the State Council of the People's Republic of China, 2009.

Lowe, Christian. "RATTLRS Strike Fast." DefenseTech.com website  
<http://www.defensetech.org/archives/002748.html> (accessed 27 April 2009).



Military Sealift Command, "Prepositioning." Military Sealift Command website. <http://www.msc.navy.mil/pm3/> (accessed 25 April 2009).

Missile Defense Agency, "Boost Phase Defense." Missile Defense Agency website. <http://www.mda.mil/mdalink/html/boost.html> (accessed 25 April 2009).

Missile Defense Agency, "KEI Fact Sheet." Missile Defense Agency website. <http://www.mda.mil/mdalink/pdf/kei.pdf> (accessed 25 April 2009).

Missile Defense Agency, "MDA Mission." Missile Defense Agency website. <http://www.mda.mil/mdalink/html/aboutus.html> (accessed 25 April 2009).

Missile Defense Agency, "Missile Defense Flight Test Results in Successful Intercept." Missile Defense Agency website. <http://www.mda.mil/mdalink/pdf/08news0090.pdf> (accessed 25 April 2009).

Missile Defense Agency, "PAC-3 and MEADS Fact Sheet." Missile Defense Agency website. <http://www.mda.mil/mdalink/pdf/pac3meads.pdf> (accessed 25 April 2009).

Missile Defense Agency, "The Threat." Missile Defense Agency website. <http://www.mda.mil/mdalink/html/threat.html> (accessed 25 April 2009).

O'Rourke, Ronald. *China Naval Modernization: Implications for U.S. Naval Capabilities- Background and Issues for Congress*. Washington, DC: Congressional Research Service, 19 November 2008.

O'Rourke, Ronald. *Navy Trident Submarine (SSGN) Conversion Program- Background and Issues for Congress*. Washington, DC: Congressional Research Service, 22 May 2008.

U.S. Congressional Budget Office. *Long Term Implications of Current Defense Plans: Summary Update for Fiscal Year 2008*. Washington, DC: Congress of the United States, December 2008, 24.

U.S. Department of Defense. *Annual Report to Congress: Military Power of the People's Republic of China 2009*. Washington, DC: Office of the Secretary of Defense, 2009.

U.S. Department of Defense. *National Defense Strategy*. Washington, DC: Office of the Secretary of Defense, June 2008.

U.S. Department of Defense. *Quadrennial Defense Review Report*. Washington, DC: Office of the Secretary of Defense, 6 February 2006.

U.S. Navy. Office of the Chief of Naval Operations. *A Cooperative Strategy for 21st Century Seapower*. Washington, DC: Department of the Navy, CNO, 2007.

U.S. Navy. Office of Naval Intelligence. *Worldwide Maritime Challenges*. Washington, DC: Department of the Navy, ONI, 2004.

U.S. President, *The National Security Strategy of the United States of America*. Washington, DC: White House, 2006.

U.S. Office of the Chairman of the Joint Chiefs of Staff. *Doctrine for the Armed Force of the United States*. Joint Publication (JP) 1. Washington, DC: CJCS, 14 May 2007.

U.S. Office of the Chairman of the Joint Chiefs of Staff. *Joint Operations*. Joint Publication (JP) 3-0. Washington, DC: CJCS, 13 February 2008.

U.S. Office of the Chairman of the Joint Chiefs of Staff. *Joint Operational Planning*. Joint Publication (JP) 5-0. Washington, DC: CJCS, 26 December 2006.

U.S. Office of the Chairman of the Joint Chiefs of Staff. *The National Military Strategy of the United States of America: A Strategy for Today; A Vision for Tomorrow*. Washington, DC: CJCS, 2004.