

# **Operational Maneuver From the Sea and the Vulnerability of Maritime Prepositioned Forces**

**A Monograph  
by  
Major Christopher T Mayette  
United States Marine Corps**



**School of Advanced Military Studies  
United States Army Command and General Staff College  
Fort Leavenworth, Kansas  
First Term AY 01-02**

**Approved for Public Release; Distribution is Unlimited**

SCHOOL OF ADVANCED MILITARY STUDIES

MONOGRAPH APPROVAL

Major Christopher T Mayette

Title of Monograph: Operational Maneuver From the Sea and the Vulnerability of  
Maritime Prepositioned Forces

Approved by:

\_\_\_\_\_  
James J. Schneider Ph.D. Monograph Director

\_\_\_\_\_  
COL James K. Greer, MMAS Director, School of  
Advanced Military  
Studies

\_\_\_\_\_  
Philip J. Brookes, Ph.D. Director, Graduate Degree  
Program

## **Acknowledgements**

Thanks to my wonderful wife Kate and children Megan, Jack and Claire. Their patience, understanding and sacrifice significantly contributed to the completion of this project.

## **Disclaimer**

The views expressed in this academic research paper are those of the author and do not reflect the official policy or position of the US government or the Department of Defense. In accordance with Air Force Instruction 51-303, it is not copyrighted, but is the property of the United States government.

## Abstract

As a force projection power, it is critical for the United States to retain the capability to introduce rapidly, credible and sustainable forces into theaters around the world. Maritime pre-positioned forces (MPF) are a key component supporting that force projection capability. Currently, there is insufficient strategic airlift to deploy rapidly and sustain heavy U. S. forces as they are currently structured.

Operations Desert Shield and Desert Storm validated the value of the MPF concept. The ability to fly in ground forces and integrate them with equipment from pre-positioned shipping greatly enhanced the strategic responsiveness of the Marine Corps and the United States. This facilitated the rapid introduction of a credible ground force into the Persian Gulf Theater of Operations for the United States. The value of this capability was recognized by the United States Army, which has since begun to purchase roll-on, roll-off shipping of its own. America's adversaries, whether they are nation states posing a conventional threat or terrorist organizations presenting an asymmetric threat will not overlook this capability either. As adversaries develop anti-access capabilities, it is critical for the United States to assess continually, the vulnerability of our maritime pre-positioned forces.

Forcible entry operations from the sea are a requirement for Marine Corps forces. The Marine Corps continues to rely on MPS as one of the cornerstones of its deployment strategy. However, the Marine Corps is changing the way these operations are conducted. Under the emerging doctrine of Operational Maneuver from the Sea (OMFTS) Marine forces will no longer wait for the arrival of MPF equipment at a port of debarkation and follow the standard reception, staging, onward movement and integration (RSOI) template of Desert Shield and Desert Storm. Several concepts under OMFTS such as Ship To Objective Maneuver (STOM) require the introduction of a Marine Air Ground Task Force with very little organic sustainment directly to the objective. Interdiction of MPF squadrons could significantly degrade U. S. strategic responsiveness or leave Marine Forces stranded in theater without sufficient resources to sustain them.

By analyzing threats at the port of embarkation, enroute and port of debarkation for current and future MPF operations a determination can be made as to whether, there is an inherent vulnerability in MPF operations. This analysis concludes that current MPF operations possess vulnerabilities in self-defense capabilities, information access, and organization and loading of the ships. Future MPF operations address the issue of organization and loading however, no decision has been made to provide self-defense capabilities or secure information access.

This monograph is significant to the development of both Army and Marine Corps future maritime force projection capabilities. In a chaotic, rapidly changing environment, maritime prepositioned forces provide a combination of responsiveness, sustainability, and forward presence independent of many political considerations such as over flight and land basing. This combination of capabilities makes them an invaluable asset to operational planners and an undeniably high value target to future adversaries.

# TABLE OF CONTENTS

Acknowledgements.....	ii
Disclaimer .....	iii
Abstract .....	iv
TABLE OF CONTENTS .....	v
List of Figures .....	vi
Acronyms .....	vii
Introduction.....	1
Scope .....	3
The Research Question.....	5
Significance of the Study.....	5
Marine Corps Operational Concepts.....	10
Operational Maneuver from the Sea.....	12
Ship-to-Objective Maneuver .....	16
Sea Based Logistics .....	19
Sustained Operations Ashore.....	22
Maritime Pre-Positioned Force Operations .....	25
Current MPF .....	26
Maritime Prepositioned Force Enhancement .....	33
Maritime Prepositioned Force Future.....	34
Threats to Maritime Prepositioned Forces.....	40
Subsurface Threats.....	40
Surface Threats .....	42
Air Threats .....	44
Mines .....	46
Weapons of Mass Destruction .....	47
Analysis.....	50
OMFTS Scenario .....	50
Current MPF .....	52
MPFE .....	56
MPF Future .....	56
Conclusions and Recommendations .....	60
Recommendations for Current MPF.....	61
Recommendations for Future MPF.....	62
MPF and the Future Environment.....	63
Appendix A .....	67
Appendix B .....	71
BIBLIOGRAPHY .....	72
Books.....	72
Government Documents.....	73
Periodicals, Publications and Articles .....	75
Monographs, Theses, Reports and Unpublished Articles.....	76

## List of Figures

Figure		Page
2-1.	OMFTS Future Vision	14
2-2.	Ship to Objective Maneuver	16
3-1.	MPSRON Organization	28
3-2.	Notional MPF Planning Timeline	30
3-3.	Sea State Equivalent Chart	36
5-1.	OMFTS Notional Scenario part 1	51
5-2	OMFTS Notional Scenario part 2	52

## Acronyms

AAA	Arrival and Assembly Area
AAAV	Advanced Amphibious Assault Vehicle
AACG	Arrival Airfield Control Group
AAOE	Arrival and Assembly Operations Element
AAOG	Arrival and Assembly Operations Group
ACE	Air Combat Element
APOD	Air Port of Debarkation
APOE	Air Port of Embarkation
ASO	Air Security Officer
BOG	Beach Operations Group
CIC	Combat Information Center
CMPF	Commander Maritime Prepositioning Force
COMINT	Communications Intelligence
ELINT	Electronics Intelligence
EMW	Expeditionary Maneuver Warfare
FAST	Fleet Anti-terrorist Strike Team
FIE	Fly-In Echelon
FPO	Force Protection Officer
IBU	Inshore Boat Unit
IMINT	Imagery Intelligence
ISAR	Inverse Synthetic Aperture Radar
LCAC	Landing Craft Air Cushion
LFSP	Landing Force Support Party
LPA	Littoral Penetration Area
LPP	Littoral Penetration Point
LPS	Littoral Penetration Site
LPZ	Littoral Penetration Zone
LSO	Land Security Officer
LSOC	Land Security Operations Center
MAGTF	Marine Air Ground Task Force
MAST	Mobile Ashore Support Terminal
MASINT	Measurement and Signature Intelligence
MCC	Movement Control Center
MIUW	Mobile Inshore Undersea Warfare
MPA	Maritime Patrol Aircraft
MPF	Maritime Prepositioned Forces
MPS	Maritime Prepositioned Ships
MPSRON	Maritime Prepositioning Ship Squadron
NCW	Naval Coastal Warfare
NEF	Naval Expeditionary Force
NSE	Naval Support Element
NTDS	Naval Tactical Data System
OCU	Offload Control Unit
OME	Operational Maneuver Element
OMFTS	Operational Maneuver From The Sea
POG`	Port Operations Group
PSU	Port Security Units
RSSC	Radar-Sonar Surveillance Center

SBL	Sea Based Logistics
SPOD	Sea Port of Debarkation
SPOE	Sea Port of Embarkation
SSES	Ship's signals Exploitation Space
SSO	Seaward Security Officer
SSOC	Seaward Security Operations Center
SOA	Sustained Operations Ashore
STOM	Ship To Objective Maneuver
TALCE	Tanker Airlift Control Element
VBSS	Visit Board Search and Seizure

## Chapter 1

### Introduction

The world in which U.S. forces operate is continually changing. In 1990 Saudi Arabia was a willing ally in the U.S. led efforts to remove Iraqi forces from Kuwait. The Saudi Arabian government's cooperation and the use of their extensive facilities provided the United States an excellent staging area to conduct operations against Iraqi forces. Just over a decade later, as of January 18, 2002, Iraq is still a hostile threatening power in the Middle East; however, the news today is reporting that the Saudi Arabian government is rethinking its relationship with the United States and may possibly ask for the removal of U.S. forces from Saudi Arabia. This sort of diplomatic anti-access significantly affects U. S. force projection capabilities and requires reconsideration of current force structure. No one can definitively predict what the future operating environment will look like. Nevertheless, rapid change and uncertainty will almost certainly be two significant characteristics of that environment.

Change in itself is difficult to deal with, however the increasing rate of change around the world compounds this problem and creates a chaotic environment dramatically increasing potential places of employment for U. S. military forces. Couple that with the fact that "the U.S. has never been able to rely exclusively on forward basing or overseas access as a means of positioning forces to meet regional crisis."<sup>1</sup> In this type of environment, maritime pre-positioned forces provide a level of forward presence, strategic responsiveness and power projection regardless of other nations political environment. This creates a more dependable capability for planning of force projection operations.

The Marine Corps Concept of Operational Maneuver from the Sea (OMFTS) provides "a sustainable forcible entry capability that is independent of forward staging bases, friendly

---

<sup>1</sup> Charles Krulak, "MPF 2010 and Beyond. A Concept for the Conduct of Maritime Prepositioning Operation in the 21<sup>st</sup> Century," *Marine Corps Gazette*, February 1998, A-1.

borders, over flight rights, and other politically dependent support.”<sup>2</sup> The sustainability of this capability is impossible for any significant duration without the availability of Maritime Pre-positioned Shipping (MPS). It is the relationship between these two complimentary capabilities, specifically the impact of a degradation of the MPS capability, which this monograph will explore.

## Background

The deployment of U.S. forces to the Persian Gulf region for operations Desert Shield and Desert storm has long been heralded as a great success. It was one of the largest deployments in US history. In terms of people and equipment, it exceeded in the first three weeks, the amount moved to Korea during the first three months of that war. By the sixth week, it had surpassed the ton-miles flown during the entire 65 week Berlin Airlift.<sup>3</sup>

Despite the overall success of this enormous effort, there still were areas of significant concern. The first concern was that the initial ground forces were not a “balanced” force and there was no “support system” in place, consequently they were forced to rely on host nation support and what they brought for sustainment.”<sup>4</sup> A second area of concern arose from the fact that “nearly 7 months passed before a sustainable force capable of offensive operations was fully positioned because of transportation limitations.”<sup>5</sup> This delay exposed vulnerabilities in the United States’ strategic responsiveness capability, specifically, an inability to put a credible and sustainable force into theater quickly. Adversaries could pursue anti-access capabilities to further

---

<sup>2</sup> U. S. Marine Corps, Marine Corps Combat Development Command, Concepts Division, *Operational Maneuver From The Sea* (Quantico, VA, 1996), V-5.

<sup>3</sup> James K. Matthews and Cora J. Holt, *So Many, So Much, So Far, So Fast: United States Transportation Command and Strategic Deployment for Operation Desert Shield/Desert Storm* (Washington, D.C.: U.S. Government Printing Office, 1996), 12.

<sup>4</sup> Douglas Menarchik, *Powerlift: Getting to Desert Storm: Strategic Transportation and Strategy in The New World Order* (Westport, CT: Praeger, 1993), 51.

<sup>5</sup> Scott W. Conrad, *Moving The Force Desert Storm and Beyond* (Washington, D.C.: U.S. Government Printing Office, 1994), 24.

delay this entry and possibly achieve a favorable decision before the United States was capable of responding.

Those concerns aside, there were extremely successful aspects of the force deployment to the Persian Gulf. Operations Desert Shield and Desert Storm provided the Marine Corps an opportunity to display its Maritime Prepositioned Force (MPF) concept. The Marine Corps deployed the 7<sup>th</sup> Marine Expeditionary Brigade (MEB) from 29 Palms to link up with Maritime Prepositioned Squadron 2 (MPSRON) from Diego Garcia and the 1<sup>st</sup> MEB from Hawaii to link up with MPSRON 3 from Guam. The first MPSRON ships arrived by the eighth day of Desert Shield, a full 12 days faster than the earliest fast sealift ships from the continental United States. This facilitated 1<sup>st</sup> MEB's complete unloading by September 6, 1990 and 7<sup>th</sup> MEB just two days later.<sup>6</sup> Desert Shield validated the MPF concept. The lesson was clear: "It was the prepositioned ships of the Marine Corps and Army that saved the day during the early stages of Desert Shield."<sup>7</sup>

The Military Sealift Command (MSC) also utilizes Desert Storm to highlight the primacy of the sea in long-term sustainment. The MSC notes "nearly 95 percent of all peacetime military equipment and supplies move by sea and during Desert Storm MSC provided 10 million tons of cargo for the war effort."<sup>8</sup> The experiences of the gulf war emphasize the value of the MPF concept and sea based sustainment. This has provided the impetus for further experimentation with the MPF concept and force projection and sustainment capabilities.

## Scope

There are numerous emerging concepts and draft doctrinal publications focusing on strategies and force structure to meet future operational needs. This monograph will limit the discussion to operational concepts, specifically OMFTS and its relationship to MPF operations.

---

<sup>6</sup> General Accounting Office, National Security and International Affairs Division, *Military Afloat Prepositioning: Wartime Use and Issues for the Future* (Washington, D.C., 1992), 16.

<sup>7</sup> Conrad, 9.

<sup>8</sup> Erin M. Metzinger, "Prepositioning as a Joint Undertaking: Military Sealift Command's Afloat Prepositioning Force," *Marine Corps Gazette*, August 1997, 13.

The Marine Corps capstone concept of Expeditionary Maneuver Warfare (EMW) is discussed only in terms of its relationship to OMFTS. Information provided in this monograph is completely derived from unclassified sources, emerging concepts, and doctrine.

This monograph will further limit its scope by primarily focusing on the Marine Corps MPF concepts and MPS ship capabilities. These capabilities are representative of other afloat prepositioned force concepts.

## **Thesis Methodology**

The Marine Corps concept of Operational Maneuver from the Sea and the associated concepts of Ship To Objective Maneuver, Sustained Operations Ashore and Sea Based Logistics will be defined utilizing emerging Marine Corps concepts and doctrine in chapter two. The establishment of the key tenets of OMFTS will come directly from Marine Corps publications, concept papers and documents.

Critical to the development of this thesis is an understanding of the capabilities, limitations and general operations of maritime prepositioned shipping discussed below in chapter three. Operations Desert Shield and Desert Storm provide a historical background for the conduct of MPF operations. This establishes the critical value of MPS to strategic responsiveness and U. S. force projection operations. It further indicates the effectiveness and speed with which prepositioned shipping introduces and sustains forces in a theater of operations.

Once OMFTS, MPF and other key concepts are defined, threats to MPF shipping will be analyzed at the port of embarkation, enroute and port of debarkation in chapter 4. Analysis of threats at these points will be conducted using primary and secondary sources, interviews, doctrinal publications and concept papers.

A notional OMFTS operational scenario from the emerging doctrine is utilized in chapter five to analyze the effects of the threats identified in the previous chapter. Conclusions and

recommendations to correct any vulnerabilities that invalidate the OMFTS concept are listed in chapter six and focus on operations, doctrine and force structure.

### **The Research Question**

The purpose of this monograph is to answer the following central question: Is there an inherent vulnerability to Maritime Prepositioned Forces that invalidates the Marine Corps concept of Operational Maneuver From the Sea?

### **Significance of the Study**

As a force projection power, it is critical for the United States to retain the capability to introduce rapidly, credible and sustainable forces into theaters around the world. Maritime prepositioned forces are a key component supporting that force projection capability. A lack of strategic airlift and a reduction in forward basing are two limiting factors affecting US force projection capabilities.

Currently there is insufficient strategic airlift to deploy rapidly and sustain heavy U. S. forces as they are currently structured. James Matthew and Cora Holt documented this in their analysis of the Gulf War when they noted one of USTRANSCOM's biggest problem was a backlog of sustainment cargo at aerial ports of debarkation and an airlift fleet not large enough to carry both air-eligible unit cargo and air-eligible sustainment cargo."<sup>9</sup> The second limiting factor, a reduction in forward basing, is evidenced by the fact that "since the conclusion of the Gulf War the Army has decreased forward basing from nearly 40 percent of all army units to less than 20 percent."<sup>10</sup>

---

<sup>9</sup> Matthews and Holt, 84. Douglass Menarchik takes a different view on pages 85 and 86 when he notes that airlift actually accounted for 15.3% of the total lift. This significantly exceeded the 5% planning factor utilized for strategic airlift at that time, and he concludes this may require a greater emphasis on "surge" airlift capability. Although this is an impressive accomplishment, it still indicates that the overwhelming majority of supplies arrived via other means and highlights the lack of strategic airlift to support a major force projection operation.

<sup>10</sup> Conrad, 45.

Operations Desert Shield and Desert Storm validated the MPF concept. The ability to fly in ground forces and integrate them with equipment from prepositioned shipping greatly enhanced the strategic responsiveness of the Marine Corps and the United States. This facilitated the rapid introduction of a credible ground force into the Persian Gulf Theater of Operations for the United States. The value of this capability was recognized by the United States Army, which has since begun to purchase roll-on roll-off shipping of its own. America's adversaries, whether they are nation-states posing a conventional threat or terrorist organizations presenting an asymmetric threat will not overlook this capability either. As adversaries develop anti-access capabilities, it is critical for the United States to assess continually, the vulnerability of our maritime prepositioned forces. If vulnerabilities exist, they will significantly affect force projection, strategic responsiveness, and force structure.

Forcible entry operations from the sea are a core competency requirement for Marine Corps forces.<sup>11</sup> The Marine Corps continues to rely on MPS as a cornerstone of its deployment strategy. One could draw a conclusion from Desert Storm that it solidified the US dependence on enroute staging and reception infrastructure and determine that those type requirements are critical to success in the future.<sup>12</sup> However, the Marine Corps is changing the conduct of these operations. Under the emerging doctrine of OMFTS, Marine forces will no longer wait for the arrival of MPF equipment at a port of debarkation and follow the standard reception, staging, onward movement and integration (RSOI) template of Desert Shield and Desert Storm. Several concepts under OMFTS such as Ship To Objective Maneuver (STOM) require the introduction of a Marine Air Ground Task Force with very little organic sustainment directly to the objective.<sup>13</sup> Interdiction of MPS squadrons could significantly degrade U. S. strategic responsiveness or leave Marine forces stranded in theater without sufficient resources to sustain them.

---

<sup>11</sup> U. S. Marine Corps, Doctrine Division, *Marine Corps Doctrinal Publication 1-0, Marine Corps Operations* (Washington, D.C., 2001), 2-3.

<sup>12</sup> Menarchik, 181.

<sup>13</sup> *Operational Maneuver From The Sea*, V-13.

## *Key Terms*

Due to the diverse understanding of terminology, several key terms utilized throughout the monograph are defined below. They provide the reader with a common understanding of the definitions as they pertain to this monograph.

### *Strategic Responsiveness*

Army doctrinal publication FM 3-0 Operations lists the following seven attributes of strategically responsive forces: (1) Responsiveness, (2) Deployable (3) Agile, (4) Versatile, (5) Lethal, (6) Survivable and (7) Sustainable.<sup>14</sup> Closely related to this is the concept of strategic mobility, which is the “capability to deploy and sustain military forces worldwide in support of national strategy.”<sup>15</sup>

### *Vulnerabilities*

**Strategic vulnerability:** The susceptibility of vital instruments of national power to being seriously decreased or adversely changed by the application of actions within the capability of another nation to impose. Strategic vulnerability may pertain to political, geographic, economic, informational, scientific, sociological, or military factors.”<sup>16</sup>

**Inherent vulnerability:** Webster’s dictionary defines inherent as “existing in someone or something as a natural and inseparable quality, characteristic, or right; innate; basic; inborn.”<sup>17</sup>

### *Force Projection*

**“Force projection:** The ability to project the military element of national power from the continental United States (CONUS) or another theater, in response to requirements for military operations. Force projection operations extend from mobilization and deployment of forces to redeployment to CONUS or home theater.”<sup>18</sup>

**“Maritime power projection —** Power projection in and from the maritime environment, including a broad spectrum of offensive military operations to destroy enemy forces or logistic support or to prevent enemy forces from approaching within enemy weapons’ range of

---

<sup>14</sup> U. S. Army, *FM 3.0 Operations* (Washington, D.C., 2001), 3-1.

<sup>15</sup> U. S. Department of Defense, *Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms* (Washington, D.C., 2001), 413.

<sup>16</sup> *Ibid.*, 414.

<sup>17</sup> *Webster’s New World Dictionary*, 2<sup>nd</sup> College Edition, 1982, 724.

<sup>18</sup> *Joint Publication 1-02*, 170.

friendly forces. Maritime power projection may be accomplished by amphibious assault operations, attack of targets ashore, or support of sea control operations.”<sup>19</sup>

## Summary

Desert Storm validated the MPF concept, but not completely. Saudi Arabia’s facilities and the time allowed for US forces to enter the theater provided an ideal environment to conduct MPF operations. It is unlikely that the US will achieve such favorable conditions in future operations. Adversaries understand the value of this capability and a new methodology is required to deal with this new environment. “As U.S. bases overseas close, strategic sealift’s capability to preposition and deliver equipment and supplies assumes a more critical role in the Nation’s strategy of forward presence.”<sup>20</sup>

There is insufficient strategic airlift to meet the deployment or sustainment needs of a major operation such as Desert Shield and Desert Storm. The strategic mobility triad is made up of sealift, airlift and prepositioning of forces and supplies. Forward basing of forces is being reduced. Airlift is fast, however, the first two fast sealift ships arriving in Saudi Arabia after three weeks carried more equipment than all the aircraft had delivered to that point.<sup>21</sup> Consequently, maritime prepositioned capabilities and sealift are more critical components of overseas presence and force projection than they were 10 years ago.

The Marine Corps is responding to the challenge of this future environment by developing a variety of concepts to meet the requirements of future operations. Operational Maneuver from the Sea is the capstone operational concept for the Marine Corps, and is designed to provide a force capable of meeting the challenges of future operations and flexible enough to remain relevant well into the twenty first century.

---

<sup>19</sup> *Joint Publication 1-02*, 263-264.

<sup>20</sup> Metzinger, 13.

<sup>21</sup> *Ibid.*, 9.

“America often opts for a graduated response, using diplomacy first, followed by increasing economic pressures and then military posturing. The timing of a graduated response using coercive diplomacy flows from the logistics time-phased deployment schedule.”<sup>22</sup> An inherent vulnerability in MPF operations may invalidate the OMFTS concept and seriously handicap US operations and strategy.

---

<sup>22</sup> Menarchik, 183.

## **Marine Corps Operational Concepts**

### **Introduction**

Marine Corps Strategy 21 outlines in broad terms the direction the Marine Corps is pursuing in the twenty first century.<sup>23</sup> From this broad outline, the Marine Corps Capstone Concept of Expeditionary Maneuver Warfare was developed and signed by General Jones, Commandant of the Marine Corps on 10 November 2001, to move the Marine strategy of maneuver warfare forward into the twenty first century. Expeditionary Maneuver Warfare is the unifying thread that ties together the Marine Corps' maneuver philosophy, expeditionary nature, core competencies and all the associated lower concepts influencing organization, deployment and employment of the Marine Corps. Operational Maneuver from the Sea is the principal supporting concept at the operational level.<sup>24</sup>

### **Future Operational Environment**

To understand the genesis of the Marine Corps concepts discussed in this chapter, it is important to grasp the underlying Marine Corps vision of the future operating environment and the challenges it will pose. This vision of the future operating environment provides the foundation for building Marine Corps future concepts. The future environment is seen through two lenses, first is the environment itself and the second is what actual war will look like in the future.

The Marine Corps believes that the new environment will focus our operations in the littoral regions of the world. The littoral regions provide a crossroad for mankind as population demographics shift in increasing numbers to these regions, supplying resources, trade, and centers

---

<sup>23</sup> U. S. Marine Corps, *Marine Corps Strategy 21* (Washington, D.C., 2000), i.

<sup>24</sup> U. S. Marine Corps, *Expeditionary Maneuver Warfare, Marine Corps Capstone Concept* (Washington, D.C., 2001), 1-2.

of power. The fundamental nature of war, a violent and chaotic clash of opposing wills, and maneuver warfare doctrine, will not change significantly in the future operational environment. However, new technology will influence when, where, and who we fight.<sup>25</sup>

OMFTS is the Marine Corps concept to deal with this environment. Current operational design focuses on centers of gravity, decisive points and lines of operation. However, “the future battlespace will be characterized by nonlinear operations which are not focused on occupation of terrain, with dispersed centers of gravity and critical vulnerabilities which are difficult to locate and target.”<sup>26</sup> This requires a capability that is highly mobile, responsive, lethal and agile. In short, a force that possesses the attributes of strategic responsiveness discussed earlier.

Future operational concepts address an environment typified by what the Marine Corps refers to as “The Break down of Order.” This break down is characterized by an environment where threats may range from a new hostile superpower, to a regional power with weapons of mass destruction or non-state actors that develop their own means of mass destruction. Not only is the range of threats extensive, but the new environment will be more chaotic demonstrated by an increased rate of change as loyalties shift rapidly for numerous reasons ranging from opportunity to ideology.<sup>27</sup>

In addition to a changing world environment, wars will exhibit new characteristics, although the same fundamental nature, in the future operating environment. Three primary characteristics of future wars that the Marine Corps envisions are: (1) improved technology for all participants which creates (2) more lethal weapons resulting in (3) less people required to achieve a comparable level of destruction to today. Therefore, linear operations with extensive rear areas will be more vulnerable and considered high value targets to small lethal enemy forces. To counter this aspect of the future environment the Marine Corps is developing the ship-to-

---

<sup>25</sup> *Operational Maneuver From The Sea*, V-3-V-4.

<sup>26</sup> U. S. Marine Corps, Combat Development Command, Concepts Division, *The MAGTF in Sustained Operations Ashore* (Quantico, VA, 1998), IV-3.

<sup>27</sup> *Operational Maneuver From The Sea*, V-5-V-7.

objective and shore to ship maneuver concepts. These concepts reduce the logistic footprint of landing forces, which are also smaller in number due to increased lethality. In short, adversaries will “combine the destructive capability of a conventional force with the elusiveness of a guerilla” requiring a more flexible, mobile, and responsive landing force to decisively engage them.<sup>28</sup>

## **Operational Maneuver from the Sea**

Operational Maneuver from the Sea is the key operational concept for the Marine Corps in the twenty first Century. Nested in the Expeditionary Maneuver warfare concept and Marine Corps Strategy 21, “it provides our vision of what Operational Maneuver from the Sea is, and what naval forces in the near future should be able to do.”<sup>29</sup> Operational Maneuver from the Sea is the capstone operational concept of the various Marine Corps operational warfighting concepts. Other operational concepts related to OMFTS and nested in the EMW doctrine include Ship-To-Objective Maneuver (STOM), Sustained Operations Ashore (SOA), Sea Based Logistics (SBL) and MPF 2010 are described in this chapter. Concepts are under development, in the areas of aviation, fires, information, MOUT command and control, anti-armor, mine countermeasures and non-lethal weapons, which support or relate to OMFTS capabilities. This monograph explores the relationships between OMFTS and the MPF and therefore only discusses the key operational concepts relating to both of these concepts. This section will review the characteristics, principles, capabilities and limitations of OMFTS and those key related concepts.

Operational maneuver from the Sea confers a degree of freedom of action to Marine forces by applying the maneuver warfare doctrine to amphibious operations. Utilizing the sea as maneuver space and a base for sustainment enables Marine forces to create dilemmas for adversaries, capitalize on opportunities and maximize the use of deception to strike unexpectedly.

---

<sup>28</sup> *Operational Maneuver From The Sea*, V-7, 8.

<sup>29</sup> *Ibid.*, V-5.

In essence, Marine forces can dominate the tempo of operations by determining where and when to give battle at operational objectives, which represent critical vulnerabilities for our adversaries. This concept is applicable to the full spectrum of military operations.<sup>30</sup>

Conducting operational maneuver from the sea is not a new concept. The Inchon landing in Korea is a classic example of operational maneuver from the sea.<sup>31</sup> The use of the sea as a mobile basing facility to provide sustainment is new and an integral part of the OMFTS concept. The sea has always provided a degree of freedom of action and force protection for those who control it. This freedom of action is frequently handicapped by the transition to land based operations which require the methodical build up of combat power and sustainment supplies ashore. This build up restricts landing area choices and tethers the force to an immobile rear area. Operational Maneuver from the Sea coupled with the future MPF concepts will free future naval forces from these constraints. These new concepts will allow naval forces to completely exploit the advantages of the sea. For example, a force leaving Spain could threaten the entire eastern seaboard of the United States without the need for intermediate staging bases. In addition to providing the advantages listed above for conventional operations seabasing and OMFTS will facilitate humanitarian assistance missions by freeing more Marines to go directly to the areas needing assistance without setting up intermediate facilities and providing force protection for those facilities.<sup>32</sup>

---

<sup>30</sup> *MCDP 1-0, Marine Corps Operations*, 2-15.

<sup>31</sup> *Operational Maneuver From The Sea*, V-12.

<sup>32</sup> *Ibid.*, V-13, V-15.

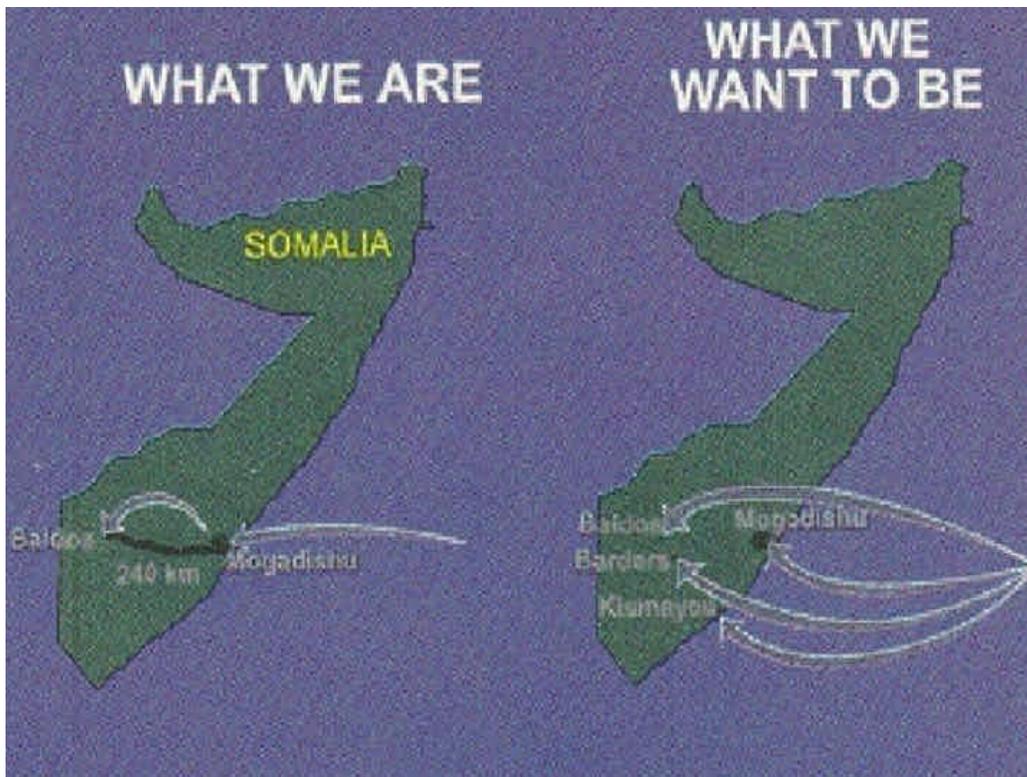


Figure 2-1 OMFTS Future Vision.<sup>33</sup>

### Principles of OMFTS

To understand the concept of OMFTS it is important to examine the underlying principles that it is founded upon. There are six primary principles that apply to OMFTS. Many of the capabilities discussed throughout this monograph that are required to support these principles are still in development. Enumerated below are the six key principles of OMFTS and a brief explanation of each.

- (1) **Focus on the operational objective.** The operation must be viewed as a continuous event from the port of embarkation to the operational objective ashore. Intermediate objectives or establishing lodgments ashore assume less importance in OMFTS as the force is centered on decisive maneuver to seize the force objective.

---

<sup>33</sup> *Operational Maneuver From The Sea*, V-15

- (2) **Uses the sea as maneuver space.** The sea provides an avenue of approach and a barrier to the threat's movement. This allows the force to use deception and strike unexpectedly anywhere misleading the enemy as to the actual point of attack.
- (3) **Generates overwhelming tempo and momentum.** The tempo generated through maneuver from the sea provides the commander freedom of action while limiting the enemy's freedom of action.
- (4) **Attacks asymmetrically to pit friendly strength against enemy weakness.** The freedom of action the sea confers allows the commander the maneuverability to attack in strength against enemy critical vulnerabilities.
- (5) **Emphasizes intelligence, deception and flexibility.** Deception enhances force protection and intelligence and flexibility allow the commander to exploit opportunities as they arise.
- (6) **Integrates all organic, joint and combined assets.** To fully realize the potential of OMFTS compatibility and integration of all available joint assets.<sup>34</sup>

These principles indicate OMFTS is an operational concept that does not dramatically differ from other operational concepts except in its use of the sea for sustainment and as maneuver space. In order to exploit the advantages of the sea as maneuver space and employ the OMFTS concept several capabilities need to be developed. OMFTS will require changes in technology, doctrine, organization and mobility to “overcome challenges in the areas of battlefield mobility, intelligence, command and control, fire support, aviation, mine countermeasures, and sustainment.”<sup>35</sup> The MV-22 Osprey tilt rotor airplane, AAV, LCAC and ships of MPF 2010 are systems currently fielded or under development to enhance battlefield and operational mobility and sustainment. In terms of doctrine, the emerging concepts of STOM, SOA, Sea Based Logistics, MPF 2010, and Mine Counter Measures (MCM) all support the capstone concept of OMFTS.

---

<sup>34</sup> MCDP 1-0, *Marine Corps Operations*, 2-15-2-16.

<sup>35</sup> *Operational Maneuver From The Sea*, V-18-V-20.

## Ship-to-Objective Maneuver

Ship-to-Objective Maneuver is a tactical concept that represents one of the primary capabilities of OMFTS. This concept describes how the Marine Corps can capitalize on “emerging technologies to develop greater capabilities for our amphibious operations, operations characterized by extraordinary mobility and flexibility, that are able to be executed in depth.”<sup>36</sup> This section discusses the capabilities STOM provides and some of the doctrinal definitions and principles required to utilize the concept. The STOM concept supports OMFTS by removing many of the difficulties traditionally associated with amphibious operations as displayed in figure 2-2 below.

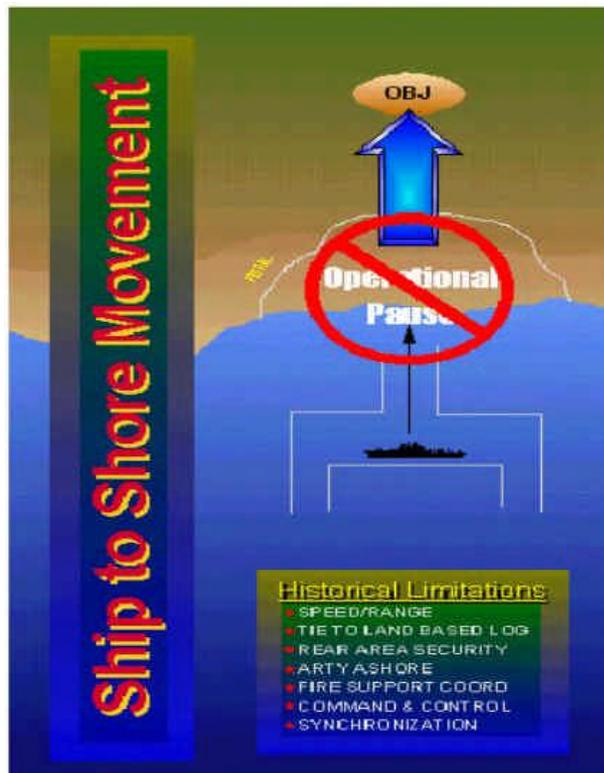


Figure 2-2 Ship to Objective Maneuver.<sup>37</sup>

<sup>36</sup> U. S. Marine Corps, Marine Corps Combat Development Command, Concepts Division, *Ship-To-Objective Maneuver* (Quantico, VA, 1997), II-1.

<sup>37</sup> *Ibid.*, II-6.

The ability to maneuver rapidly in tactical formation from over the horizon directly to objectives dramatically changes the nature of amphibious operations. Technological improvements in command and control, mobility and firepower will enable true amphibious maneuver. Under this concept, forces operate from over the horizon exploiting the mobility advantages provided by the sea to counter area denial techniques and avoid enemy strengths while attacking critical vulnerabilities. Area denial systems such as mines, submarines, anti-ship missiles and aircraft will be less effective because of the dispersion required to cover all possible avenues of approach from the sea. Furthermore, “by requiring the enemy to defend a vast area against our seaborne mobility and deep power projection, naval forces will render most of his force irrelevant.”<sup>38</sup>

Ship to objective maneuver adheres to the same principles as OMFTS. Modifications to the explanations of these principles reflect the tactical nature of the STOM concept. The focus is still on an operational objective, however; STOM avoids the cumbersome enlargement of beachheads. The sea is used as maneuver space to turn an enemy flank or exploit gaps in his defenses. Intelligence, deception and flexibility support maneuver execution and find or create exploitable gaps. Application of strength against weakness exploits physical gaps and gaps in enemy capabilities. Surface and vertical assaults to inland positions capitalize on deception and surprise disrupting enemy responses and creating overwhelming tempo. Lastly, the integration of all joint assets to accomplish the mission is critical to future joint interoperability.<sup>39</sup>

To control forces under the STOM concept required the development of new terminology to describe different areas of the battlespace. The four new coordination measures developed are: Littoral Penetration Area (LPA), Littoral Penetration Zone (LPZ), Littoral Penetration Site (LPS), and Littoral Penetration Point (LPP). Defined below are these geographic coordination measures.

**Littoral Penetration Area (LPA)** –A geographic area designated for purposes of command and control through which naval forces conduct littoral penetration

---

<sup>38</sup> *Ship-To-Objective Maneuver*, II-4-II-8.

<sup>39</sup> *Ibid.*, II-8, 9.

operations. This area must be of sufficient size to permit the unrestricted conduct of sea, air, and land operations. Normally one LPA will be associated with each possible objective area.

**Littoral Penetration Zone (LPZ)** - LPAs can be subdivided into smaller geographical zones to enhance command and control or to facilitate coordination of maneuver and fires. Each LPZ can contain several alternative axes for use by vertical or surface assault forces.

**Littoral Penetration Site (LPS)** - A continuous segment of coastline within an LPZ through which landing forces cross by surface or vertical means.

**Littoral Penetration Point (LPP)** - A point in an LPS where the actual transition from waterborne to land borne movement occurs (“feet wet” to “feet dry” for flying elements). Capitalizing on the precision location and navigation capabilities of the landing force, an LPP need only be large enough to support the passage of a single craft, but it may be used by a maneuver element or series of maneuver elements passing in column. When the terrain provides adequate space, the maneuver element may cross the LPP in its tactical formation.<sup>40</sup>

Ship-to-Objective maneuver requires a detailed consideration of four planning factors.

First, the objective must be of strategic or operational significance. The second planning factor is the execution and timing of pre-assault tasks such as mine clearing. Planning must address synchronization of these tasks with expected maneuver and address the requirement for an in-stride breaching capability to compensate for any failures in accomplishing the pre-assault tasks. The third significant planning factor is task organization and embarkation of the landing force. Current amphibious operations phases follow the template of planning, embarkation, rehearsal, movement and assault (PERMA). The OMFTS concept envisions the assault forces rendezvousing with MPS enroute. Under this construct, operations will follow the template of embarkation, movement, planning, rehearsal and assault (EMPRA). Lastly, the distances, cycle times and lift availability for surface and vertical assault operations of the landing force require detailed planning and synchronization. Conducting operations, in which forces attack in tactical

---

<sup>40</sup> *Ship-To-Objective Maneuver*, II-11-13.

formation directly from a seabase over the horizon with multiple movement rates and distances to objectives, significantly complicates the planning and synchronization problem.<sup>41</sup>

Several capabilities are required to capitalize on the vision of projecting forces directly to their objectives while minimizing the footprint ashore by maintaining the bulk of command and control (C2), fire support and supply at sea. Currently, improvements are under way in the areas of mobility with the Advanced Amphibious Assault Vehicle (AAAV), Landing Craft Air Cushion LCAC, and the MV-22 Osprey. Decentralized C2 with improved intelligence assets that focus on identifying enemy forces and impediments to mobility coupled with responsive, precise and lethal long range precision fires are necessary to support this concept. To turn this concept into a reality also requires improvements in information operations, seabased logistics (discussed below), organization, doctrine, and training.<sup>42</sup>

### **Sea Based Logistics**

Seabased logistics is the primary enabler that facilitates the realization of the OMFTS and STOM concepts. This concept provides in-stride sustainment from over the horizon to maneuvering forces utilizing technological advantages in ship design and network based automated systems. The freedom of action the sea provides allows the seabase to shift rapidly the lines of communication and support alternate operational objectives while operating under the protection of a carrier battle group.<sup>43</sup>

Currently, seabased logistics is not feasible because modern military forces require enormous amounts of fuel, ground and aviation ordnance. To address this problem, seabased logistics depends on a combination of improved technology and the seabasing of capabilities that historically have gone ashore. Advances in long-range precision fires enable the seabasing of

---

<sup>41</sup> *Ship-To-Objective Maneuver*, II-17-18.

<sup>42</sup> *Ibid.*, II-20-23.

<sup>43</sup> U. S. Marine Corps, Marine Corps Combat Development Command, Concepts Division, *Seabased Logistics* (Quantico, VA, 1998), 1-2.

most fire support platforms. Technological improvements in connectivity and distributed planning allow for the seabasing of command and control as well. Technology that decreases fuel and ammunition requirements coupled with greater visibility of the logistics requirements of the force and efficient inventory control and distribution will reduce the footprint ashore. Ship to shore movement will be faster as the logistics tail of the landing force decreases allowing the Marine Corps to reduce or eliminate the operational pause at the beachhead normally required in amphibious operations. The reduced footprint ashore also enables the rapid re-embarkation of the landing force to strike at other operational objectives creating a tempo of operations, which overwhelms the adversary.<sup>44</sup>

There are five tenets of Seabased Logistics, which define the model for operations and sustainment under this concept. The five tenets, (1) primacy of the seabase, (2) reduced demand, (3) in-stride sustainment, (4) adaptive response and joint operations, and (5) force closure and reconstitution at sea are described below.

The primacy of the sea base tenet emphasizes the shift of sustainment to a mobile over the horizon sustainment base while reducing the logistics footprint ashore. This tenet provides the advantage of reducing the force protection requirements necessary to protect a large static logistic base ashore, freeing up more forces for decisive operations. The ability to maneuver the seabased logistics reduces the constraints associated with basing rights and host nation support. Operationally, land and air lines of communication can be opened and closed allowing the commander flexibility in tailoring support. The primacy of seabasing will be its ability to build, project, and sustain combat power ashore indefinitely.<sup>45</sup>

Technological improvements, smaller but equally lethal forces ashore and reducing the footprint ashore are the basis of the reduced demand tenet. Technology to improve efficiency in inventory management of combat service support, and fighting vehicles that generate power for

---

<sup>44</sup> *Operational Maneuver From The Sea*, V-10.

<sup>45</sup> *Seabased Logistics*, 1-3.

maneuver and energy directed weapons are examples of the types of improvements desired.<sup>46</sup>

Forces ashore will be smaller and highly mobile but retain the lethality of conventional forces by leveraging aviation and seabased fire support.

In-stride sustainment also leverages technology to switch from push logistics to pull logistics. Concepts like total asset visibility, improved communications of consumption data and a selective offload capability from the seabased ships facilitate this tenet. The selective offload capability, which is the core capability of in-stride sustainment, requires construction and loading of ships to support the rapid retrieval and distribution of essential items from storage.<sup>47</sup> In current MPF operations the MPS ships are administratively loaded because of an emphasis on space maximization, consequently selective unloading is difficult at best.<sup>48</sup>

The ability to conduct operations across the entire spectrum of conflict from humanitarian assistance to major theater war is the focus of adaptive response and joint operations. Beyond the spectrum of conflict, the adaptive response aspect also signifies the ability to operate in any environment regardless of the availability of ports and airfields. This tenet further emphasizes the importance of joint compatibility for all systems to ensure the force can fully integrate with theater and expeditionary logistics when demand exceeds the capacity of the sea base.<sup>49</sup>

Force closure and reconstitution at sea, the last tenet of seabased logistics, is essentially the reception, staging, onward movement and integration (RSOI) of forces at sea. This eliminates the political and physical requirements associated with land based RSOI such as basing rights, over-flight permissions, adequate seaports of debarkation and airports of debarkation. "Key to effective closure will be the integration of the Amphibious Task force, Combat Logistics Force,

---

<sup>46</sup> *Seabased Logistics*, 1-4.

<sup>47</sup> *Ibid.*, 1-4.

<sup>48</sup> Colonel Charles Skipper and Maj. Robert R. Ruark, "Agile Sword," *Marine Corps Gazette*, June 1995, 16-20.

<sup>49</sup> *Seabased Logistics*, 1-5.

MPF 2010, Ready Reserve Force, and other Military Sealift Command elements designed for integration within the sea base.”<sup>50</sup>

Seabased logistics is a critical component to the realization of the OMFTS concept and execution of the Expeditionary Maneuver Warfare doctrine. The inability to provide sustainment from a mobile logistics base over the horizon severely degrades the mobility and tempo of operations the OMFTS force can generate. Indefinite sustainment ensures the OMFTS force can conduct operations throughout the depth and breadth of the area of operations over time.

### **Sustained Operations Ashore**

Sustained Operations Ashore (SOA) is a concept nested in the Expeditionary Maneuver Warfare doctrine. The MPF 2010 concept provides the strategic mobility to the Marine Air Ground Task Force (MAGTF), which enables execution of SOA and the complimentary concept of OMFTS. The Marine Corps has historically maintained the capability to conduct sustained operations ashore such as World War I in France and Operation Desert Storm in Southwest Asia. The principles and tenants of OMFTS and STOM are enablers, which allow the MAGTF to carry out SOA. The MAGTF of the future will be a self-contained, self-sustaining integrated combined arms team with enhanced forcible entry capabilities capable of functioning as an enabling force, decisive force or exploitation force. Under the Expeditionary Maneuver Warfare doctrine and utilizing the principles of OMFTS, the Sustained Operations Ashore concept “envisions the MAGTF remaining a general purpose force, but one capable of executing a series of precise, focused combat actions rather than primarily participating in continuous, methodical ground operations.”<sup>51</sup>

The MAGTF can utilize the maneuverability provided by the sea to support a wide range of enabling operations, such as establishing lodgments, deception, and diversion operations as well as conduct decisive operations along the entire depth of the area of operations. By

---

<sup>50</sup> *Seabased Logistics*, 1-5.

maximizing a seabased posture, the MAGTF will be able to execute, reconstitute, and maneuver to the next objective throughout the area of operations making it an ideal exploitation force to counter enemy reactions to our operations.<sup>52</sup>

The seabase allows the commander to reduce the footprint ashore. In SOA, this footprint could be the whole MAGTF or may entail a small ground combat element, or an aviation combat element operating from an expeditionary Forward Operating Base (FOB) or a Forward Arming and Refueling Point (FARP). A typical seabase would include at least one carrier battle group for force protection, a MAGTF appropriately task organized and tailored to the size of the operation, MPF 2010 elements and amphibious shipping.<sup>53</sup> The ability to deploy and sustain various elements of the MAGTF within the theater of operations provides unparalleled flexibility and versatility to meet the contingencies likely to arise in a rapidly changing and chaotic environment. The seabase is a critical component of this capability.

Sustained Operations Ashore requires the development of the other concepts discussed in this paper as well as improvements in the areas of C2, mobility, firepower, logistics and force protection. In this respect, all of these concepts are closely interwoven. The MPF 2010 concept provides the strategic mobility to reach the theater with an operationally relevant and durable force. The ships, landing craft, aircraft and high mobility vehicles of the GCE, which support the STOM concept to strike across the entire area of operations, enhance operational mobility. Seabased logistics which is also capable of prolonged periods ashore through the development of a modified FARP concept capable of rearming, refueling, resupplying, and repairing ground maneuver elements as well as aircraft provides the sustainment piece essential to all of the concepts. Technological advances, which facilitate a common operating picture, distributed, collaborative planning, joint connectivity, and compatibility of systems are essential to the

---

<sup>51</sup> *The MAGTF in Sustained Operations Ashore*, IV-3-IV-4.

<sup>52</sup> *The MAGTF in Sustained Operations Ashore*, IV-5-IV-8.

<sup>53</sup> *Ibid.*, IV-10.

development of these concepts.<sup>54</sup> The interrelationship of all of these concepts and the technology, force structure, organization and doctrine required to support them defines the course of experimentation and development for the Marine Corps in the twenty first Century.

## Summary

All of the concepts discussed in this chapter require significant improvements in the areas of doctrine, force structure, organization and technology. The current timeline for the introduction of systems such as the MV-22 Osprey, AAV, Short Take Off Vertical Landing (STOVAL) airframe, DD-21 arsenal ship, and the LPD-17 begins with an initial operational capability (IOC) in 2001 and has all systems fully operational capable (FOC) by 2020.<sup>55</sup> These concepts will undoubtedly change as they mature but they provide a roadmap for the direction the Marine Corps is following into the 21<sup>st</sup> century. The essential elements of the MAGTF, the ground combat element, aviation combat element, combat service support element, and command element will remain in the future. However, the MAGTF “must align its tactics, techniques and procedures with the tenets of *Operational Maneuver from the Sea, Ship to Objective Maneuver*, and *MPF 2010 and Beyond*. Seabasing is the thread that ties these concepts together, describing a capability which capitalizes on the maneuverability and protection afforded by the sea.”<sup>56</sup> Additionally, seabasing provides the ability to sustain, reorganize and reconstitute at sea. Maritime prepositioned forces will play a critical role in this sustainment function and inevitably determine the success of such operations.

---

<sup>54</sup> *MAGTF in Sustained Operations Ashore*, IV-12-17.

<sup>55</sup> U. S. Marine Corps, *Joint Military Operations Marine Service Brief* (Naval War College, Newport, RI, 19 April 1999), 45; referenced in Anthony M Haslam, *Operational Maneuver From the Sea: A Counter to Area Denial in the 21<sup>st</sup> Century* (Naval War College, Newport, RI, 17 May 1999), 14.

<sup>56</sup> *The MAGTF in Sustained Operations Ashore*, IV-17.

## Maritime Pre-Positioned Force Operations

### Introduction

Desert Shield and Desert Storm validated the value of current MPF operations. However, as the operating environment changes, MPF operations must evolve to remain relevant. In addition to the standard MPF force utilized in the past, there is an enhanced program (MPFE) already funded and underway and the *MPF 2010 and Beyond* concept (MPF Future) which describes the capabilities and characteristics of future MPF operations. The evolution of MPF operations is important because current organization and structure do not meet the requirements of OMFTS. “Operational Maneuver from the Sea demands seamless integration of maritime prepositioning and amphibious task forces; *MPF2010 and Beyond* will achieve it.”<sup>57</sup> This chapter discusses current MPF operations, the new capabilities provided by MPFE, and the MPF Future as articulated in the MPF 2010 concept paper and its relation to OMFTS.

The three MPS squadrons of the Marine Corps are only one part of the larger Afloat Prepositioning Force (APF). The APF consists of 37 ships, 15 assigned to the Marine Corps MPS squadrons, 13 from the army war reserve, and 9 other prepositioning ships organized under the U. S. Strategic Sealift Force. The strategic sealift force is the largest of the Maritime Sealift Command’s (MSC) three peacetime forces and combines the APF, with fast sealift ships from the U.S., two aviation support ships which support Marine Corps aviation assets, and a number of chartered ships.<sup>58</sup>

---

<sup>57</sup> U. S. Marine Corps, Marine Corps Combat Development Command, Concepts Division, *Maritime Prepositioning Force 2010 and Beyond* (Quantico, VA, 1997), V-11.

<sup>58</sup> Metzinger, 13. These numbers are a modification of the source document and reflect the addition of the two MPF(E) ships already delivered.

## Current MPF

Current MPF operations involve the rapid deployment of the fly-in echelon (FIE) forces of the MAGTF, which then link up with the equipment from the designated MPS squadron. The MPF is a tailored combination of prepositioned and airlifted material organized to meet the requirements of a specific operation. It can involve individual MPS ships with a small MAGTF element or provide an MPF MAGTF of approximately 18,000 Marines and sailors 30-days of sustainment utilizing a full MPSRON. Current MPF operations require a permissive environment to assemble the force. The MAGTF conducts reception, staging, onward movement and integration ashore in coordination with host nation support.<sup>59</sup> This is one of the principal differences between current MPF operations and future concepts.

The final draft version of the Marine Corps Warfighting publication 3-32 Maritime Prepositioning Force Operations defines permissive, uncertain and hostile environments as follows.

**Permissive Environment:** An operational environment in which host country military and law enforcement agencies have control and the intent and capability to assist operations that a unit intends to conduct.

**Uncertain Environment:** An operational environment in which host government forces, whether opposed to or receptive to operations that a unit intends to conduct, do not have totally effective control of the territory and population in the intended area of operations.

**Hostile Environment:** An operational environment in which hostile forces have control and the intent and capability to effectively oppose or react to the operations a unit intends to conduct. (Joint Pub 1-02.)<sup>60</sup>

These definitions are important in developing an understanding of the necessary conditions to conduct current MPF operations as opposed to MPF Future operations.

Current MPF operations provide strategic responsiveness and the flexibility to conduct

---

<sup>59</sup> U. S. Marine Corps, *Marine Corps Warfighting Publication 3-32, Maritime Prepositioning Force Operations* Final Draft (Washington, D.C., 2000), 1-1 - 1-5.

<sup>60</sup> *Ibid.*, 6-1.

operations ranging from humanitarian assistance to major theater war. “In the event of a crisis, an MSPRON needs only 12 hours notice to get underway and proceed to marry up with MAGTF personnel flown into the theater of operations.”<sup>61</sup> Unlike future concepts, which seamlessly integrate MPF and amphibious operations, current MPF operations are complimentary with amphibious operations. Amphibious operations cover forcible entry situations and MPF operations cover unopposed operations in a permissive environment. “The existence of this power projection capability is a deterrent to potential adversaries.”<sup>62</sup> Because current MPF operations require a permissive environment, the actual sea and air ports of debarkation may be a significant distance from the actual area of operations.

### Organization and Equipment

An MPF is a temporary organization comprised of a MPF MAGTF and assigned Navy forces under the MAGTF command element, Navy forces, and a MPSRON under the command of the Commander, Maritime Prepositioning Force (CMPF). The MPF MAGTF contains a Naval Mobile Construction Battalion to provide deliberate engineering support including major horizontal and vertical construction, facilities repair, and other general engineering support and a 500 bed Fleet Hospital in addition to the normal elements associated with a MAGTF. The Navy MPF is comprised of the command element (CMPF), the MPSRON, the Naval Support Element for offload and ship to shore movement and the Naval coastal Warfare element which provides command and control and force protection capabilities for harbor defense and port security.<sup>63</sup>

The Marine Corps currently has three squadrons of MPS ships. MPSRON 1 consists of five ships positioned off the U.S. east coast or in the Mediterranean. The second MPSRON, located at Diego Garcia in the Indian Ocean has six smaller ships. Lastly, MPSRON 3 operates from Guam in the Pacific Ocean with four ships. Each MPSRON contains essentially the same

---

<sup>61</sup> Metzinger, 13.

<sup>62</sup> *MCWP 3-32, Maritime Prepositioning Force Operations*, 1-3.

<sup>63</sup> *Ibid.*, 3-1-3-4.

mix and amount of equipment and materiel. These ships provide combat equipment (tanks, amphibious assault vehicles, howitzers, light armored vehicles and missile launchers), combat support equipment (trucks, engineering and material handling equipment, fuel storage and distribution systems and medical facilities) and sustainment supplies (food, water, petroleum, oil, lubricants, ammunition construction materials, medical supplies and repair parts) sufficient to sustain and MPF MEB for approximately 30 days.<sup>64</sup> Displayed in figure 3-1 below is the typical organization of an MPSRON.

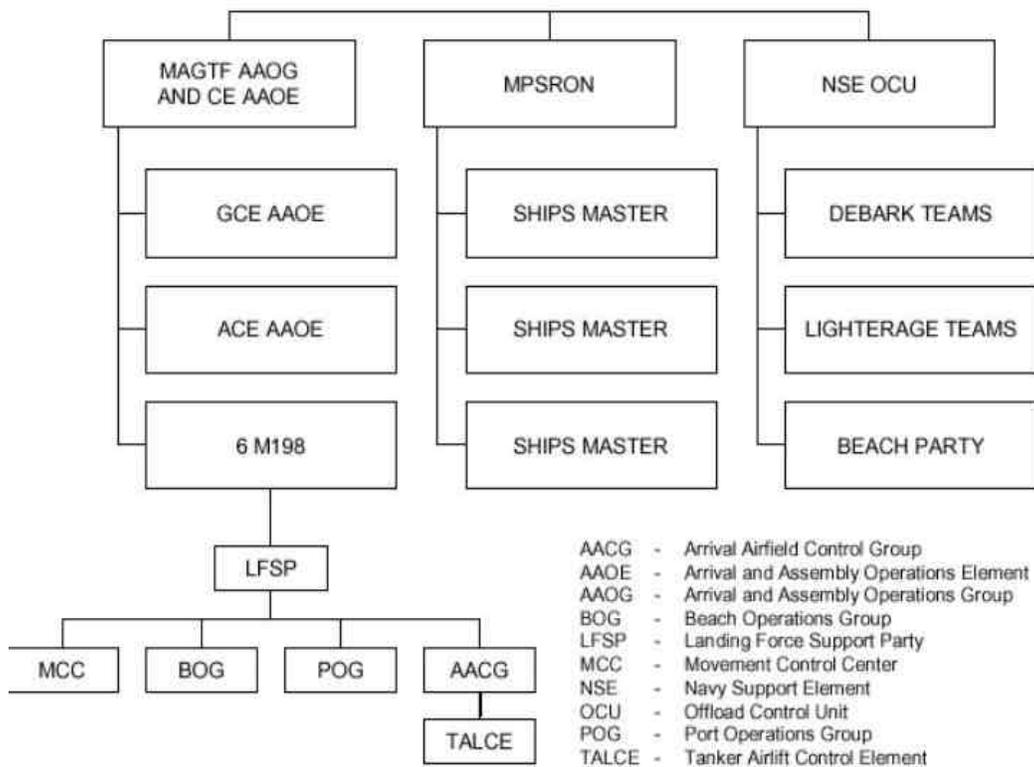


Figure 3-1 MPSRON Organization.<sup>65</sup>

<sup>64</sup> *Military Afloat Prepositioning: Wartime Use and Issues for the Future*, 8-12. Original numbers modified to reflect the delivery of two MPF(E)ships already delivered.

<sup>65</sup> U. S. Marine Corps, MAGTF Staff Training Program, *MEF Planner's Reference Manual* (Quantico, VA, 1999), 14.

## Doctrine

Emerging doctrine defines several required conditions necessary to establish the MPF MAGTF ashore. The first condition is the existence of a permissive environment through arrival and assembly. There must be adequate strategic airlift, aerial tanker support, and airfield space must be capable of supporting Marine tactical, AMC, and Civil Reserve Air Fleet (CRAF) operations and throughput. Adequate off-load forces (i.e. MAGTF and Naval Support Element [NSE]) to support the operation and an ample port and beach area available for timely offload and throughput must be on hand. Lastly, a suitable transportation network between port/beach and airfields and adequate force protection capabilities are essential. These conditions are necessary for the MAGTF to achieve full operational capability within 10 days of initiating the offload.<sup>66</sup>

Planning, marshalling, movement, arrival and assembly, and regeneration are the five phases of maritime prepositioned force operations. The planning phase consists of either deliberate or crisis action planning and commences upon receipt of the warning order. Organization and final preparation for deployment is conducted in the second phase of the operation. The movement by air, of the fly-in echelon, and sea, of the prepositioned equipment, occurs in phase three. The fourth phase, arrival and assembly, begins with the arrival of the first ship or plane and ends when adequate equipment and supplies are off-loaded, C2 established, and the MAGTF commander reports that all essential elements of the MAGTF have attained combat readiness. Lastly, regeneration is the methodical restoration of the MPSRON to its original strength and operational capability.<sup>67</sup> In current MPF operations, this takes a lot of time and space on land, which contrasts with the MPF 2010 concept of conducting regeneration at sea.

---

<sup>66</sup> MCWP 3-32, *Maritime Prepositioning Force Operations*, 1-4 - 1-5. Current MPF operations are capable of conducting offload without an adequate port in conditions up to sea state 3. However, this significantly delays the process and makes favorable sea states a prerequisite for operations.

<sup>67</sup> *Ibid.*, 1-7,8.

Provided below in figure 3-2 is an example of a notional MPF planning timeline.

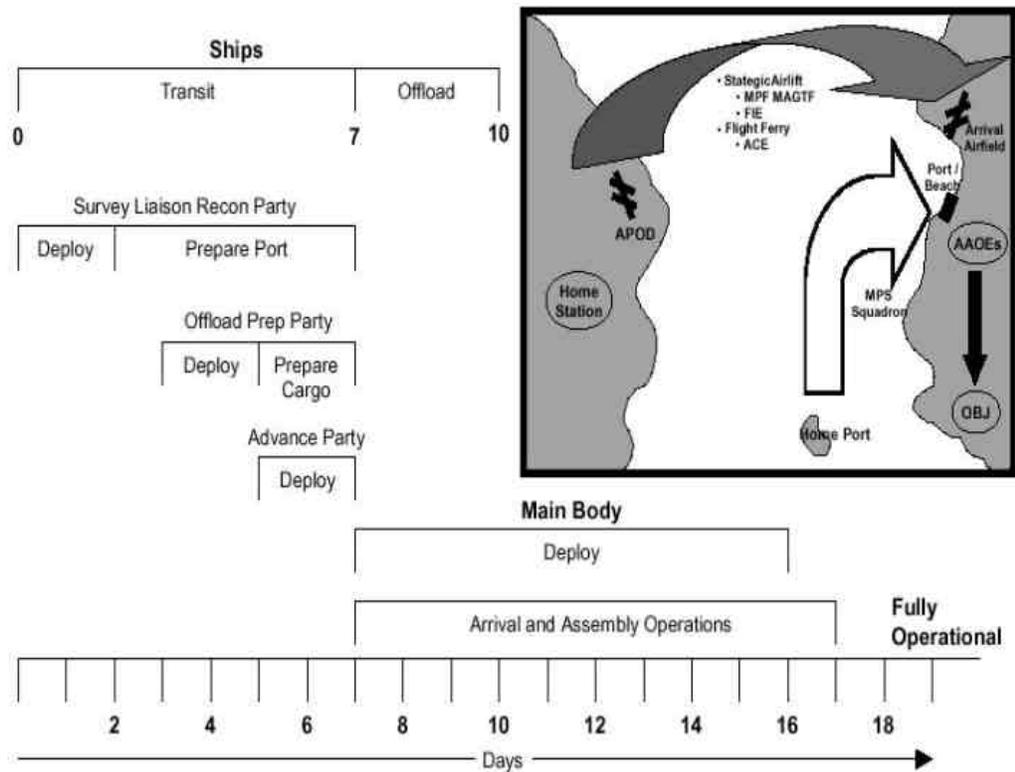


Figure 3-2 Notional MPF Planning Timeline.<sup>68</sup>

The reliance on external support is another area that current doctrine differs from emerging concepts. As previously discussed, seabased logistics attempts to reduce the footprint ashore through emerging technology and the seabasing of capabilities that have historically operated ashore. Current doctrine emphasizes the need to leverage host nation support, existing logistics systems and infrastructure as much as possible to reduce the logistic burden on the MPF.<sup>69</sup>

<sup>68</sup> *MEF Planner's Reference Manual*, 47

<sup>69</sup> MCWP 3-32, *Maritime Prepositioning Force Operations*, 8-1.

## Force Protection Measures

Under current draft doctrine, “the primary goal of force protection planning is to provide a permissive Amphibious Assembly Area (AAA) for the MPF operation.”<sup>70</sup> Responsibilities for force protection are divided between a variety of commanders depending on the type of threat and stage of operation currently being conducted. For example, the naval component commander is responsible for force protection during sea transit, the establishing authority determines responsibility after arrival in the AAA and the JFACC is responsible for protection against air threats including tactical ballistic missiles. The assets and organization of the force protection force is tailored to the mission and can include elements such as a Fleet Anti-terrorist Strike Team (FAST), naval coastal warfare, maritime patrol craft and Naval Special Warfare Command (NAVSPECWARCOM).<sup>71</sup>

The draft doctrine on MPF operations briefly addresses the most vulnerable aspects of current operations. It emphasizes that the MPF is “highly vulnerable to various air attacks,” and that the “MPF is most vulnerable during the movement phase and least vulnerable upon completion of the MAGTF force standup.”<sup>72</sup> This indicates a belief that emerging doctrine perceives a sense of security in the integrated force protection capabilities provided in the AAA with the MPF MAGTF, and a disbelief in the ability of an adversary to overcome our technological and conventional advantages asymmetrically at these points. The threats and analysis section of this monograph develops a different conclusion concerning points of vulnerability. The MPF Future concept focuses more on mobility as a force protection tool vice the belief in technology providing an overwhelming force protection advantage in the AAA. In transit, “surface escorts, augmented by air surveillance assets, are assigned force protection responsibilities for MPS.”<sup>73</sup> However, Naval Warfare Publication 3-07.12 gives commanders a

---

<sup>70</sup> MCWP 3-32, *Maritime Prepositioning Force Operations*, 5-1.

<sup>71</sup> Ibid.

<sup>72</sup> Ibid., 5-4.

<sup>73</sup> Ibid.

wide range of options to provide escort. This publication states that protection of shipping can be viewed as a primary or collateral mission and that “employment is directly or indirectly linked to the location of the protected vessel.”<sup>74</sup>

The five primary functions for MPF security forces are situational awareness, command and control, seaward security, landward security and air security. Situational awareness encompasses total visibility of all air, land, sea, and subsurface contacts that can influence the MPF operations. A dedicated force protection organization with a designated force protection officer in charge coordinates command and control to provide a common operating picture for the establishing authority, MAGTF Commander and CMPF. This dedicated force protection organization includes the seaward security officer (SSO), landward security officer (LSO), and air Security officer (ASO). Each of these functional area specialists develops preplanned responses to all possible threats in their functional area.<sup>75</sup> For a complete list of elements assigned to each security function, see Appendix A.

Operational forces sequence into theater in the following order to facilitate the MPF operation. Landward security elements from the in-theater MEU, or fly-in echelon from outside the theater, are the first force protection forces sequenced into the AAA. These forces secure the APOD, SPOD, and beaches necessary for MPF operations as well as establishing initial liaison with host nation security forces. C4ISR elements are sequenced into theater next and “establish the force protection C2 organization, and coordinate force protection measures with host nation agencies.” The seaward security elements arrive last coordinate seaward security with host nation support and conduct final sweeps of the AAA for any threat to shipping.<sup>76</sup>

---

<sup>74</sup> Department of the Navy, Naval Doctrine Command, *Naval Warfare Publication 3-07.12 Naval Control and Protection of Shipping* (Norfolk, VA, 1996)

<sup>75</sup> MCWP 3-32, *Maritime Prepositioning Force Operations*, 5-1-5-3.

<sup>76</sup> *Ibid.*, 5-10.

## Maritime Prepositioned Force Enhancement

The MPF(E) program provides additional capabilities to current MPF operations during the development of future MPF Marine Corps concepts.<sup>77</sup> MPF(E) consists of an additional three ships divided evenly between the three current MPSRONS. The enhancement program combines the three new ships with additional combat and support equipment and operational concepts. The additional capabilities support current operations better, and will help maintain a relevant force projection capability until future concepts can come on line.

The Marine Corps, based on lessons learned from Operation Desert Storm, exercises and war games identified the need for the enhancement program. The requirement corrects deficiencies in the current MPF due to lack of space for all equipment on the original 13 ships, the increased embarkation footprint of modern combat systems and the addition of new equipment necessary to support an armor heavy brigade equivalent. Unified and Component Commands concurred with the requirement to compensate for the reduction of U.S. forces, the reduction of forward basing and the enabling capabilities provided by the early entry of the new support packages. The enhancement program provides a greater capability in less time. Estimates indicate establishment of an expeditionary airfield by week three, a full seven weeks ahead of current capabilities.<sup>78</sup>

The three new MPF ships provide several new capabilities to the MPF MAGTF. The ships have roll-on roll-off (RO/RO) capability, amphibious launch capability and can off load cargo anchored at sea or pier side. They will provide an expeditionary airfield set with a 3800-foot runway capable of night operations and parking for 75 aircraft, a Navy Expeditionary Medical Support System (NEMSS) with six operating tables and 420 acute care beds and a Naval

---

<sup>77</sup> "Enhanced Maritime Prepositioning Force Update," *Marine Corps Gazette*, April 2000, 7.

<sup>78</sup> U.S. Department of Defense, Inspector General, *Evaluation Report: The U. S. Marine Corps Maritime Prepositioning Force Enhancement Program* (Arlington, VA, 1995), p7-8.

Mobile Construction Battalion for vertical and horizontal construction.<sup>79</sup> The second of the MPF(E) ships was delivered in March 2001, and the last one will be operational sometime in 2002.<sup>80</sup>

The primary operational change is an attempt to seamlessly integrate MPF(E) operations with the amphibious ready group (ARG) afloat with the MEU's. This change supports MPF future concepts for operational employment of the MPF. It quickly provides a more robust force making it easier for additional forces deploying from the states to link up with the equipment. MPSRON ships will follow the operational movements of the ARG to facilitate a rapid unification of these two forces. Gen Jones, Commandant of the Marine Corps believes this combination "can double the combat force in virtually 24 hours."<sup>81</sup> Although it is debatable whether this actually doubles the combat force, it is undeniable that it provides a significant improvement and more relevant combat force. The MPF(E) transition is almost complete and will provide enhanced capabilities for present operations. The enhancement still falls short of the requirements and capabilities envisioned under the MPF future concepts and OMFTS.

### **Maritime Prepositioned Force Future**

Maritime Prepositioned Force Future as developed from the concept paper *MPF 2010 and Beyond* establishes the vision "by which the next generation MPFs will contribute to forward presence and power projection; capabilities that will remain central to U.S. deterrence and conflict resolution strategies well into the future."<sup>82</sup> While MPFE is an evolutionary change to the MPF concept adding additional capabilities, MPF Future is a revolutionary change in the conduct of operations and capabilities provided. OMFTS requires a more robust capability than

---

<sup>79</sup> David, Huff, "Situation Report: The MPF Ships," *Seapower Magazine*, Nov 2001, 2. Available from the Internet online [http://www.navyleague.org/seapower\\_mag/nov2001/situation\\_report.htm](http://www.navyleague.org/seapower_mag/nov2001/situation_report.htm), [15 Jan 02].

<sup>80</sup> Military Sealift Command, *MSC 2001 in Review* [Homepage online] available from <http://www.msc.navy.mil/annualreport/2001/pm4.htm>. Internet accessed 20 Feb 02.

<sup>81</sup> Gidget, Fuentes, "A 'floating dump'? Think again," *Navy Times*, 4 November, 1996, 27-29.

<sup>82</sup> Krulak, A-3.

is currently provided. MPF Future forces “will combine the capacity and endurance of sealift with the speed of airlift to rapidly deploy MAGTFs to objective areas with the capability for indefinite sea-based sustainment.”<sup>83</sup> To realize fully the potential of OMFTS requires new technology, organization, doctrine and training. MPF future is a key enabler allowing the MAGTF to operate across the entire spectrum of military operations.<sup>84</sup>

## Doctrine

Currently there is no doctrine to support the MPF Future concept. Since publishing the concept paper, *MPF 2010 and Beyond* in 1997, the Marine Corps has continued to develop, debate and experiment with the original concept. Listed below is a description of the four primary pillars supporting future MPF operations: force closure, amphibious task force integration, indefinite sustainment, and reconstitution and redeployment. These pillars provide the basis for understanding the capabilities required to conduct MPF operations in the future.

Force closure and sustainment will allow the MPF force to assemble at sea, eliminating the need for air and sea ports of debarkation. This provides significant flexibility because it removes political constraints associated with basing rights, over flight rules and host nation coordination. It also enhances force protection by eliminating the vulnerable air and sea ports of debarkation, which serve as consolidation points for current forces.<sup>85</sup>

Amphibious task force integration is a concept the Marine Corps is trying to incorporate in the MPF(E) employment as discussed above. Several technological advances will facilitate the realization of this concept. The MPSRON ships must have compatible command and control architecture to allow for seamless information flow and a shared understanding of the battlespace. To support the OMFTS requirement of allowing the maneuver forces to deploy in tactical formation from over the horizon, the MPF ships require selective offload capability to support the

---

<sup>83</sup> *Maritime Prepositioning Force 2010 and Beyond*, V-3, 4.

<sup>84</sup> Krulak, A-3.

<sup>85</sup> *Maritime Prepositioning Force 2010 and Beyond*, V-5.

assault forces.<sup>86</sup> They also must provide facilities for the tactical employment and offload of assault support aircraft, surface assault craft, and advanced amphibious assault vehicles in conditions up to sea state three, “perform essential ship functions up to sea state 5 and survive in up to sea state eight.”<sup>87</sup> Figure 3-3 provides an explanation of the sea state conditions.

Number	Description	Definition	Winds (kts)	Average Wave Height (ft)	Sea State Equivalent
1	Light Airs	Ripples with appearance of scales	1-3	0.05	0
2	Light Breeze	Small wavelets, glassy appearance	4-6	0.18	0-1
3	Gentle Breeze	Large wavelets, crests begin to break	7-10	0.6-0.88	1-2
4	Moderate Breeze	Small waves becoming large waves, white caps appear	11-16	1.4-2.9	2-3
5	Fresh Breeze	Many white caps, chance of sea spray	17-21	3.8-5.0	3-4
6	Strong Breeze	Large waves begin to form foam crests, extensive spray	22-27	6.4-9.6	4-5
7	Moderate Gale	Sea heaps up, white foam blows in streaks, spindrift is seen	28-33	11-16	5-6
8	Fresh Gale	Moderately high waves of greater length, foam is blown, spray affects visibility	34-40	19-28	6-7
9	Strong Gale	High waves, dense foam streaks, sea begins to roll	41-47	31-40	7-8

**Figure 3-3 Sea State Equivalent Chart.**<sup>88</sup>

Indefinite sustainment is accomplished through the establishment of a sea-based conduit for logistics support. The sea base is not required to stock enormous amounts of supplies; rather it acts as a conduit for supplies flowing into theater to Marines conducting operations. This requires improved asset visibility, inventory management, and storage and retrieval capabilities not currently available. Depending on the size of operation, indefinite sustainment “might be accomplished as part of a larger sea-based logistics effort which would include not only maritime prepositioning ships, but also aviation logistics support ships, hospital ships, and offshore petroleum distribution systems.”<sup>89</sup>

<sup>86</sup> *Maritime Prepositioning Force 2010 and Beyond*, V-6.

<sup>87</sup> Huff, 3.

<sup>88</sup> *MEF Planner’s Reference Manual*, 59

<sup>89</sup> *Maritime Prepositioning Force 2010 and Beyond*, V-7.

Reconstitution is the last phase of current MPF operations and requires a large sustainment base and facilities to reconstitute the MPF back to its original form. Under the future concept, reconstitution and redeployment is accomplished in theater without the requirement for a large sustainment base or extensive material. This capability enhances force projection and forward presence by reducing the time necessary to redeploy the MPF MAGTF thereby enhancing the amount of time it is available for operations.<sup>90</sup>

MPF 2010 will require three new capabilities, fast deployment, reinforcement and sustained sea basing to be effective. Fast deployment to facilitate the rapid employment of a MEU sized element. Reinforcement capability to provide 30 day's sustainment to a MEB sized unit. Lastly, a sustained sea basing capability is essential to provide indefinite sustainment of a MEF.<sup>91</sup>

### **Force Protection Measures**

Force protection for MPF Future operations relies on speed and mobility to deny the enemy the opportunity to strike. The concept envisions conducting operations from over the horizon and continually maneuvering the landing force and the sustainment force. "Exploiting the sea as maneuver space, the dispersed, mobile MPF complicates the enemy's targeting process and takes advantage of the extended standoff range as combatants more effectively acquire and defeat incoming threats."<sup>92</sup> This ability coupled with OMFTS and STOM reduces the footprint of forces ashore, particularly rear area sustainment. Maneuvering from the sea enhances force protection by acting as a barrier to terrorists or special operation forces and eliminating the need for Marines to defend large fixed sustainment bases or lines of communications from attack."<sup>93</sup>

Currently there is no approved design for MPF ships in the future. A study conducted at

---

<sup>90</sup> *Maritime Prepositioning Force 2010 and Beyond*, V-7.

<sup>91</sup> *Ibid.*, V-9.

<sup>92</sup> *Ibid.*, V-7-8.

<sup>93</sup> *Ibid.*

the Naval Post Graduate School in Monterey recommends a design for a MPF 2010 ship. This study proposed a design for MPF Future ships, which included organic self-defense capabilities, such as a missile defense coupled with legacy and multi-function array sensors.<sup>94</sup> This study further suggests that task organization with the MPF MAGTF “would guarantee that terrorist attacks were suicide missions.”<sup>95</sup>

## Summary

Current and enhanced MPF capabilities do not support the concepts of OMFTS. These forces still provide relevant capabilities to the current force structure but must evolve to remain relevant to the changing operating environment.

Future MPF concepts support OMFTS by providing seabased sustainment, seamless integration with the amphibious assault force and a flexible and mobile seabase during sustained operations. The capabilities of the MPF Future are applicable across the full spectrum of operations from high intensity conflict to military operations other than war. MPF Future simultaneously enhances the operational capabilities of the MPF MAGTF while improving force protection through continual maneuver from over the horizon.

In OMFTS, MPF Future’s fast deployment and reinforcement capability will integrate with the ATF to augment the landing force, facilitating the rapid introduction of combat power. The sustained seabasing capability will provide full spectrum logistics support for maneuver forces, reducing the “footprint” ashore and freeing the landing force from the burden of defending bases and lines of communications. Following the operation, the MPF will conduct in-theater reconstitution and redeployment to prepare for follow-on missions.<sup>96</sup>

MPF Future is a revolutionary way to think about amphibious operations and force

---

<sup>94</sup> C. N. Calvano, R.C. Harney, R. Weekly, G. McKerrow, T. Anderson, Naval Post Graduate School, *The Maritime Preposition Force Ship 2010* (Monterey, CA, 19 Apr 1999), 72-74.

<sup>95</sup> *Ibid.*, 124.

<sup>96</sup> *Maritime Prepositioning Force 2010 and Beyond*, V-9-10.

protection. “Free from the dependence on shore-based facilities and over flight considerations, MPF 2010 will offer unmatched operational flexibility to our civilian and military leaders as they execute the National Security Strategy in the 21<sup>st</sup> century.”<sup>97</sup> It is imperative that the development of this concept addresses any inherent vulnerabilities associated with current MPF operations. Sustainment of the landing force is a critical capability that our adversaries will not overlook. Seabasing of this sustainment creates a very valuable target for adversaries. Loss of this sustainment capability before forces are ashore jeopardizes the potential for further operations. Loss of this capability after forces are ashore may jeopardize those forces and have tragic consequences. Development of the technology and doctrine to actually provide sea based sustainment and protect that sustainment is a key requirement for the realization of the OMFTS concept.

---

<sup>97</sup> *Maritime Prepositioning Force 2010 and Beyond*, V-11.

## Threats to Maritime Prepositioned Forces

### Introduction

This chapter develops a list of possible threats to MPF shipping. “Threats to MPF operations vary significantly during each phase of an MPF operation, from deep-water submarines and long-range aircraft during the transit phase, to combat swimmers, mines and small craft in the AAA.”<sup>98</sup> The analysis of each threat determines its effectiveness at the port of embarkation, enroute, and port of debarkation. Further examination establishes both symmetric and asymmetric applications of these threats. For the purpose of this monograph, asymmetric is “unconventional, unexpected, innovative or disproportional means used to gain an advantage over an adversary.”<sup>99</sup> Threats are divided into the following five categories: subsurface, surface, air, mines and weapons of mass destruction. Marine Corps Warfighting Publication 3-32, Maritime Prepositioning Force Operations provides a list of threat considerations, which is included in Appendix B.

### Subsurface Threats

Subsurface threats include deep-water, diesel and midget submarines, and underwater divers. There is a subsurface mine threat which is addressed in the mine section below. Subsurface threats pose the greatest danger at the port of debarkation because it acts as a natural choke point for MPF shipping. Most countries or organizations lack the force projection capability and funding necessary to attack MPF shipping with subsurface means at either the port of embarkation or enroute. Sabotage by underwater divers at the port of embarkation is a

---

<sup>98</sup> MCWP 3-32, *Maritime Prepositioning Force Operations*, 5-9.

<sup>99</sup> MCDP 1-0, *Marine Corps Operations* (Washington, D.C., 2001), F-5. Joint Publication 3-0 Operations describes asymmetry as “battles between dissimilar forces.” Examples given are air against land or sea forces. Under this definition, an anti-ship missile attack on MPF shipping is asymmetrical. Consequently, the Marine Corps doctrinal definition was chosen because it more fully represents the concepts of deception, and surprise associated with asymmetric attacks.

possible exception, however, this type of asymmetric attack is considerably easier to execute at the port of debarkation.

Deep-water submarines, although extremely lethal, pose an unlikely risk. The primary problem is that they are prohibitively expensive for most countries or organizations to procure, maintain, train crews and employ. Interdiction of shipping on the high seas has always been problematic due to the vast expanse of the oceans and the difficulty associated with intercepting shipments of supplies. Consequently, deep-water submarines are most effective if they position themselves at choke points such as near the port of embarkation, port of debarkation, or natural choke points such as the Straits of Malacca. Of these three places, the port of debarkation offers the adversary the best opportunity with the least expenditure of effort. However, our conventional forces are ideally suited for dealing with this type of threat.

Diesel and midget submarines on the other hand are considerably cheaper to procure and operate. These submarines pose several hazards. They could act as a launch point for underwater demolition teams, fire anti-ship missiles as well as a variety of torpedoes including the effective wake homing torpedo.<sup>100</sup> Designed for coastal defense they are ideal systems to utilize in around ports of debarkation. Considering the preference for significant port facilities to offload current MPF shipping, it is probable that adversaries will correctly template these ports and position forces accordingly. Current doctrine addresses consideration of this threat in force protection planning; however, it remains a viable concern due to the availability of systems and potential to hide in the littoral regions. Diesel submarines pose the most significant threat in this category because of their availability, lethality of torpedoes and missile systems and difficulty in detection.

Underwater divers pose a unique hazard. It is possible that they could infiltrate ports of embarkation, at Guam or Diego Garcia for example. However, the cost and intricacy of this type of operation seems unnecessary given the ability to template likely ports of debarkation.

---

<sup>100</sup> Department of the Navy, Office of Naval Intelligence, *Challenges to Naval Expeditionary Warfare* (Washington, D.C., 1997), 10.

Furthermore, MPF ships routinely move between ports in their area of operations, rarely occupy the ports at Diego Garcia and Guam, and can deploy within 12-24 hours of initial notice.<sup>101</sup> These factors greatly reduce the vulnerability and likelihood of attack by subsurface means at the port of embarkation. Once again, this is an identified threat in current force protection doctrine, however; it is extremely difficult to defend against individuals. This type of attack is likely to result in the damage to some component of the MPF ship, which may delay arrival or offload but is unlikely to cause a catastrophic loss of the ship.

### **Surface Threats**

The most obvious surface threat to MPF shipping is naval surface combat ships. This section expands on that concept to include land and surface based anti-ship missile systems and commercial vessels of all sizes capable of launching anti-ship missiles or small boarding parties. Commercial vessels, although lacking in armament, pose the greatest threat in this category due to their ability to use deception to reduce reaction time of the naval escort forces. This type of asymmetric threat provides an opportunity for smaller nation-states and terrorist organizations to strike U. S. force projection capabilities. Many terrorist organizations now possess the financial funding to acquire commercial vessels or they can hijack a ship to use in an attack of this nature.

There is no doubt that an enemy surface combatant possesses the capability to destroy MPF ships in an isolated engagement. The difficulty is the adversary's ability to force an isolated engagement. As discussed earlier, although MPF ships have no organic self defense capabilities they receive escort from U. S. Naval surface and subsurface combatants and fall under the protective air cover of the carrier battle group. Due to the large economic and technical advantage the United States enjoys, it is probable that the U.S. will maintain local naval

---

<sup>101</sup> Military Sealift Command, [Homepage online], Available at <http://www.msc.navy.mil/annualreport/2001/pm4.htm>.

superiority wherever it goes. The ability to gain and maintain local air and naval superiority provides an extremely effective deterrent to such conventional threats. Admittedly, the naval commander exercises a great deal of latitude in the method of protection and escort. This may result in the escort vessels being located some distance from the MPF force. However, the local naval superiority and surveillance capabilities should provide enough time to intercept identifiable conventional surface threats.

The second difficulty for adversary surface combatants is locating the MPF ships. Much as the submarine threat discussed above, interception on the high seas is extremely difficult. Attacks at the port of embarkation or debarkation require a naval surface fleet capable of first defeating U. S. Naval escorts, while simultaneously defending against the carrier air threat and retaining the combat power to attack MPF ships. The resources, training and technology to support such an effort are prohibitive for most adversaries.

Commercial vessels provide an asymmetric threat, which compresses the reaction time of friendly forces. If adversaries can identify likely routes of MPF ships, they may be able to intercept them with commercial vessels at international choke points. These points, such as the Straits of Malacca or Panama Canal may allow the commercial vessels to get close to the MPF ships and possibly launch an attack before the naval escorts could respond. However, the difficulty of acquiring the MPF ships continues to be a problem.

As noted above, the preference of MPF to utilize a large port of debarkation does provide an opportunity for commercial vessels to get closer to MPF shipping at points flowing into these ports. Commercial vessels are capable of launching anti-ship missiles, detaching boarding parties, or small high-speed surface vessels full of explosives to achieve the same effect as torpedoes.<sup>102</sup> The bombing of the USS Cole in Yemen on 12 October 2000 demonstrates the

---

<sup>102</sup> Thomas G. Mahnken, "America's Next War," *The Washington Quarterly*, Summer 1993, 178. Referenced in Anthony M Haslam, *Operational Maneuver From the Sea: A Counter to Area Denial in the 21<sup>st</sup> Century* (Naval War College, Newport, RI, 17 May 1999), 5.

lethality of small boats loaded with explosives. Small high-speed surface vessels launched from a larger commercial vessel before the MPF ships reach the AAA pose a relevant threat. The force protection difficulty with this threat is the time it takes to identify the commercial vessel as a threat may nullify the ability to respond. This threat is considerably more credible if the adversary can acquire transit routes and times for the MPSRONS. Consequently, asymmetric surface threats launched from commercial vessels are capable of sinking MPF ships and this type of attack is most likely to occur in or around the port of debarkation or natural choke points if the adversary can ascertain MPF transit routes and times.

### **Air Threats**

Air threats encompass enemy fixed and rotary wing combat aircraft, cruise missiles, theater ballistic missiles, anti-ship missiles, unmanned aerial vehicles (UAV) and commercial aviation. In and around the port of debarkation is the primary area of concern for air threats with the exception of long-range missile systems. The likelihood that the U. S. will enjoy air superiority provides a false sense of security concerning these threats. Unlike the majority of surface and subsurface threats discussed above, certain types of air threats are reasonably inexpensive to procure and maintain.

Current force structure and doctrine adequately addresses the fixed and rotary wing combat aircraft threat. Consequently, the likelihood of a successful attack from this medium is negligible.

Commercial aviation however presents an asymmetric threat based on deception, which forces commanders to decide whether or not to engage on a compressed timeline. Flying airplanes into ships is not a new concept. Japanese pilots routinely flew their airplanes into U. S. surface combatants near the end of World War II. In 1998, Charles J Dunlap Jr. hypothesized in *Challenging the United States Symmetrically and Asymmetrically: Can America be Defeated?*, that commercial aircraft loaded with explosives could attack an aircraft carrier hoping to create

enough hesitation by the crew to penetrate the defenses.<sup>103</sup> This sort of engagement is more effective against MPF shipping, which possess no organic self defense capability, particularly if coordinated with multiple other incidents to overload decision makers and cause hesitation.

The missile threat to MPF shipping exists in multiple forms. The National Defense Industrial Association contends, in their presentation *Feasibility of Third World Advanced Ballistic & Cruise Missile Threat: Volume 2: Emerging Cruise Missile Threat*, that the “most cost-effective strategy for deterring or fighting U.S./Allies is acquiring a ballistic/cruise missile force.”<sup>104</sup> This presentation identifies the proliferation of theater ballistic and cruise missiles as well as several options for converting unmanned aerial vehicles, fighter jets, and commercial aircraft into a “poor man’s” cruise missile. The presentation also indicates that it is extremely difficult to identify countries developing massive cruise missile fleets because cheap cruise missile technology resembles other legitimate aviation technology.<sup>105</sup> According to a 1997 Office of Naval Intelligence report, there are over 75 countries with some type of air, land or sea launched anti-ship cruise missile.<sup>106</sup> The proliferation of these assets coupled with the ability to launch them from multiple mediums and dispersed locations creates a difficult threat to defend.

The port of debarkation provides the greatest opportunity with the least effort to utilize these types of systems. It is possible to engage MPF shipping at the port of embarkation however the lack of accuracy at extended ranges may require the use of weapons of mass destruction (WMD), discussed below. Once again, adversaries relying on deception may utilize an asymmetric approach by converting small commercial aircraft or UAVs into cruise missiles, to create a dilemma for decision makers. For 10 billion dollars, a peer competitor could purchase a

---

<sup>103</sup> Colonel Lloyd J Matthews, ed., *Challenging the United States Symmetrically and Asymmetrically: Can America be Defeated* (Carlisle Barracks, PA: U. S. Army War College, 1998), 10.

<sup>104</sup> Robert E Woodside and others, National Defense Industrial Association, *Feasibility of Third World Advanced Ballistic & Cruise Missile Threat: Volume II: Emerging Cruise Missile Threat* (Arlington, VA, 22 June 2000), slide 5, [technical report online] available from [http://stinet.dtic.mil/cgi-bin/fulcrum\\_main.pl](http://stinet.dtic.mil/cgi-bin/fulcrum_main.pl) (accessed 30 Dec 01).

<sup>105</sup> *Ibid.*, slide 20-21.

<sup>106</sup> *Challenges to Naval Expeditionary Warfare*, 12.

cruise missile fleet of over 100,000 missiles. Employed in waves this force could overwhelm U.S. defenses at the port of debarkation.<sup>107</sup>

All of the air threats are capable of causing a loss of MPF shipping and significantly delaying the build up of a credible force in theater. Despite the advantage the United States enjoys in air superiority, asymmetric delivery techniques such as commercial aircraft or waves of cheap cruise missiles pose a significant threat at the port of debarkation.

## **Mines**

Mines are also a cheap and easily acquired weapon system. According to the Office of Naval Intelligence, there are over 150 types of mines available throughout the world today.<sup>108</sup> These include surface and subsurface mines of various capabilities. However, due to our extensive mine clearing capabilities it is most likely that the use of mines will only delay entry into a theater of operations without causing a catastrophic loss of an MPF ship. The potential for delay may be significant in the context of the operation and thus facilitate the adversary accomplishing his objectives before effective force projection by the United States.

Mines are most likely to be used at the port of debarkation. It is extremely difficult and not cost effective to attempt to mine the transit routes including ocean choke points. Mining open ocean transit routes is ineffective due to the vast area requiring coverage. Mines, unlike direct attack systems, do not possess the ability to attack a specific target. They are passive measures, which if laid along a choke point such as the Straits of Hormuz or around the Suez Canal would shut down all shipping in that area. This may be a viable option for some adversaries, however the assumption is that most adversaries would prefer to interdict US force projection operations without alienating the rest of the world. Consequently, by identifying likely ports of debarkation

---

<sup>107</sup> Jeffery R Barnett, *Future War, An Assessment of Aerospace Campaigns in 2010* (Maxwell AFB, Alabama: Air University Press, 1996), 31-32.

<sup>108</sup> *Challenges to Naval Expeditionary Warfare*, 5.

and mining those areas, potential adversaries still accomplish the delay desired and increase their chance of actually hitting an MPF ship.

### **Weapons of Mass Destruction**

Many of the threats mentioned above, but primarily the air threats, are capable of delivering weapons of mass destruction. Weapons of mass destruction for the purpose of this monograph include nuclear, biological, and chemical weapons. Due to the inherent difficulty acquiring MPF ships enroute, the ports of embarkation and debarkation are the most likely points for the delivery of these types of weapons.

The port of embarkation is more desirable because it accomplishes the task of delaying the MPF force, keeps contamination away from adversary forces and affects only US forces or allies and not other nations in the adversary area of operations. For example, it can be argued that part of Iraq's strategy in the Gulf War was to break up the U. S. led coalition. This would be extremely difficult if Iraq used WMD on the port facilities in Saudi Arabia. The use of WMD on the ports of embarkation at Guam or Diego Garcia would have less of a negative impact on that goal. As previously discussed, it is very difficult to actually catch the MPF ships at those ports. Attacks at the port of embarkation require detailed intelligence identifying arrival of the ships in port followed by a pre-emptive strike.

Development and delivery of these weapons is very difficult. "Given the technical difficulties, terrorists are probably less likely to use nuclear devices than chemical weapons and least likely to use biological weapons."<sup>109</sup> There is considerable debate whether adversaries would even use such weapons. Nation states are reluctant to exploit this type of weapon because of the threat of an overwhelming response from the United States. Terrorists, however, are hard to identify and target for a proportional response. Consequently, non-state actors are a greater

---

<sup>109</sup> Walter Lacquer, "Post Modern Terrorism," *Foreign Affairs* Volume 75 No 5, September/October 1996, 30.

threat because traditional deterrence is less effective. Terrorist groups must consider the possibility that the use of WMD is counterproductive to their cause. However, years of frustration from failing to achieve their goals may push a terrorist organization over the edge to use WMD against a hated foe such as the United States.<sup>110</sup>

The lethality of these systems coupled with the extensive time required for decontamination make them extremely effective tools in delaying U.S. force projection capabilities. Although it can be argued that use of WMD constitutes an asymmetric attack in itself, the most dangerous type of attack would be through an asymmetric delivery technique. These techniques such as a terrorist contamination of host nation support food or truck bombs with chemical munitions are more difficult to counter than ballistic missiles threats. U. S. conventional forces are equipped and better trained to deal with incoming missiles or surface threats. The deception involved with the asymmetric delivery means mentioned above creates a more difficult decision cycle for commanders and subordinate forces.

### **Summary**

This chapter identifies a variety of possible threats to MPF shipping. While this list is not all-inclusive, it establishes a framework for consideration of possible vulnerabilities. Adversaries will develop methods to overcome U. S. advantages. Three primary themes become apparent from this discussion.

The first is that asymmetric attacks, which rely on deception, create difficulties and time compressed decision making for friendly forces. Although current force protection doctrine for MPF shipping identifies the possibility of asymmetric attacks our current force organization and training is better suited to dealing with conventional threats. The second point to carry forward is that the expanse of the ocean and the technological difficulties associated with locating and

---

<sup>110</sup> Ibid., 31.

tracking MPF ships provides a degree of safety enroute, which is eliminated at the port of debarkation. Current preferences for robust port facilities significantly narrow the possible points that the US may utilize. This allows the adversary to template our likely destination and develop anti-access strategies from that analysis. Lastly, there is an abundance of conventional and asymmetric threats present in the world today. It is a misconception to believe that our technological superiority alone can prevent successful attacks. Adversaries will develop delivery means that overcome the overwhelming economic and technological advantages the United States enjoys. If an adversary can locate the MPF, they are capable of significantly delaying or even destroying parts of the MPF.

## Chapter 5

# Analysis

## Introduction

There are multiple threats to MPF shipping which vary greatly during each stage of the operation from the port of embarkation to the port of debarkation. This chapter introduces an OMFTS scenario drawn from the initial concept paper and analyzes the threats previously discussed against current and future MPF operations. This analysis determines the most likely point of attack during an MPF operation by a nation state and a non-state actor. It further ascertains the most likely method of attack given the capabilities of each type of adversary, and examines the effect of a successful attack. This analysis identifies inherent vulnerabilities in current and future MPF operations and determines if they invalidate the OMFTS concept.

## OMFTS Scenario

Inserted below is a sample OMFTS scenario from the 1996 concept paper *Operational Maneuver from the Sea*. Although the current MPF is incapable of supporting this scenario it provides an adequate baseline for a discussion of the relationship between MPF operations and OMFTS.

In the future, a naval expeditionary force will be able to make full use of the options provided by control of the sea. A naval expeditionary force attacking from Spain, for example, would have the ability to fight a campaign on the western side of the Atlantic without having to establish a base at some intermediate point. The ability to operate at long distance, would give a force trained and equipped for future Operational Maneuver from the Sea the freedom to land powerful forces through nearly any point along the east coast of the North American continent.

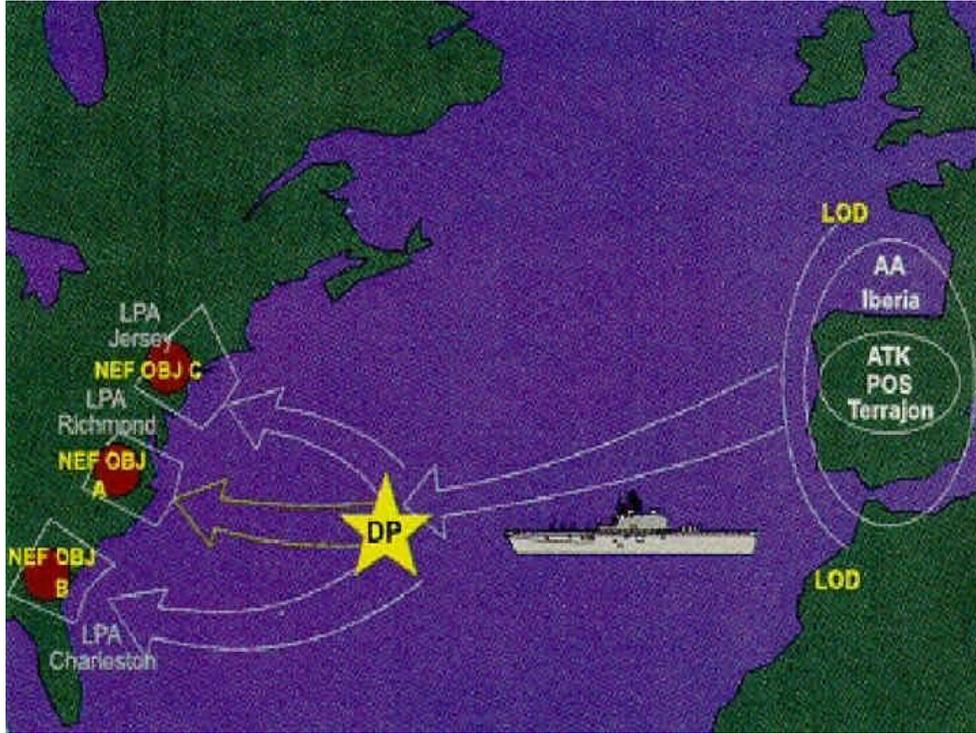


Figure 5-1 OMFTS Notional Scenario part 1.<sup>111</sup>

The forces in this example have been given the option of choosing any one of three Littoral Penetration Areas (LPA). In this case, intelligence pulls the operation toward LPA Richmond, this allows LPA Charleston or LPA Jersey to be used for deception operations if the commander chooses. The enemy is forced to attempt to be strong everywhere until the moment when he is sure that our main landing force has landed.

<sup>111</sup> *Operational Maneuver From The Sea*, V-13.

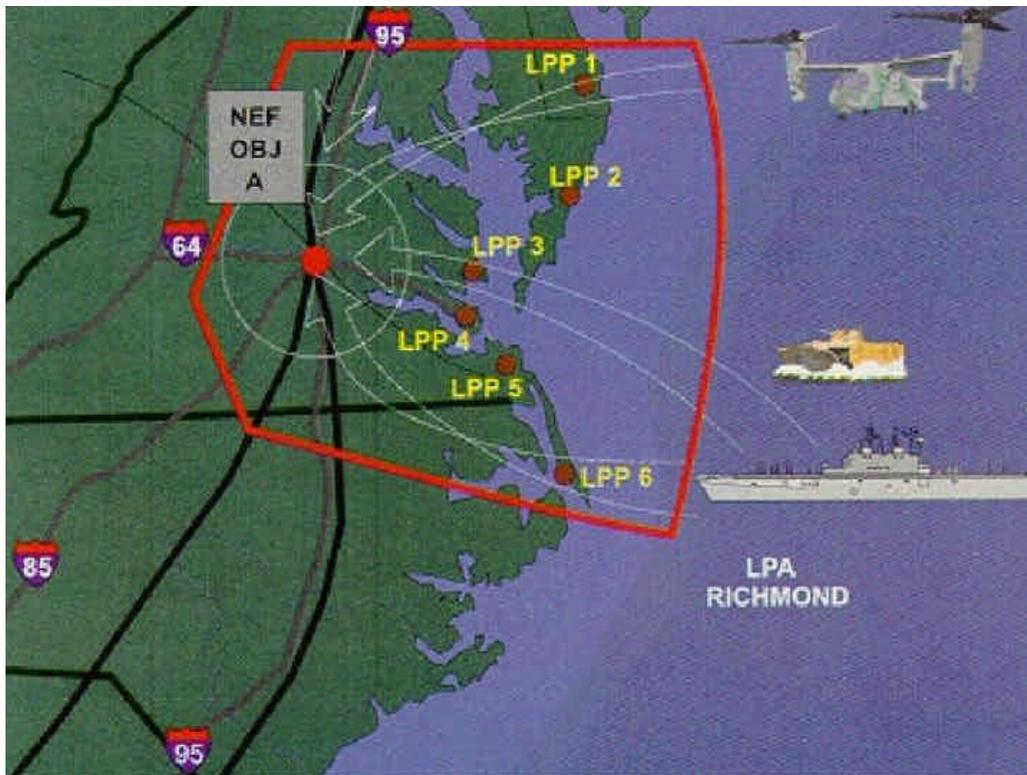


Figure 5-2 OMFTS Notional Scenario part 2.<sup>112</sup>

As the attack on Richmond (NEF Objective A) relentlessly continues, advance operations and real-time reconnaissance identify highly exploit-able Littoral Penetration Points (LPP) through which the attacking forces swarm by air and surface means to overwhelm enemy defenses. The attack progresses from ship to objective with no large or lengthy buildup on the initial beaches. (In many cases, the assaulting Marines will simply pass through the penetration points, leaving no residual forces at all.) An MPF landing reinforces this attack, while other Marines are the seaward flank for an overland southern advance of combined Army, Air Force, and allied forces.”<sup>113</sup>

### Current MPF

Current MPF operations require a permissive offload environment and as such do not support the OMFTS concept. If a secure environment is not available, as in this scenario, the MPSRON must link up with the ATF and embarked MAGTF enroute. The ATF conducts

<sup>112</sup> *Operational Maneuver From The Sea*, V-14.

<sup>113</sup> *Ibid.*, V-13, 14.

forcible entry operations at a port facility or suitable beach site, which meets the requirements established in chapter three, and establishes a lodgment that facilitates MPF offload.<sup>114</sup> To facilitate an analysis of the current MPF, the scenario above is modified as follows. Adequate port and airfield facilities are available at LPP 6. An ATF with an embarked MEU seized those facilities and the MPF ships are arriving to conduct offload of the sustainment for the fly-in echelon of the MEB.

Given current doctrine, the MPF ships provide initial sustainment, however they do not remain on station and act as a conduit for follow on sustainment. A large, immobile lodgment is created ashore and sustainment continues to flow from aviation and fast sealift ships from the United States or allied nations.

This ties the landing force and follow-on operations to one location. The physical lines of operation are easily identifiable, enabling the enemy to accurately template where the MPF offload will take place. Even if the enemy had dispersed his operating forces to react to possible penetrations along the entire east coast, those forces can now begin to converge on LPP 6. This level of predictability enhances the chances of success of virtually all threats detailed in the previous chapter. Given our conventional superiority in naval and air power it is likely that U. S. forces will be able to disrupt enemy movements toward the port of debarkation at LPP 6.

Threats at the port of debarkation are particularly valid in this scenario. The proximity of the port of debarkation to the area of operations requires considerably less force projection capability of the adversary than attempts to project power to the port of embarkation or conduct attacks of the MPF in transit. In many instances, adversaries will blend in with the local population near the ports of debarkation. This form of deception enhances the adversary's ability to carry out an asymmetric attack of some nature and compounds the intelligence gathering difficulties for the MPF force.

---

<sup>114</sup> MCDP1-0, *Marine Corps Operations* , 4-17.

Given the scenario, the MPF does not pass through any natural choke point in transit. This provides the MPF a great degree of freedom of action during transit further increasing the difficulty of intercepting the MPF ships enroute. Currently, MPF ships are prepared to get underway within 12 hours of notification. Consequently, the port of embarkation and transit routes are unlikely points of attack.

There are force protection measures in place to address the types of threats previously discussed. Force protection measures at the AAA are more robust than at any other point in the operation. The force protection command post is established in the AAA with the land, air, and sea security officers present and focused on threats inside their functional areas. Even with the higher state of alert, the predictability of port selection creates a vulnerability.

An assumption is that conventional symmetric attacks are unlikely due to the economic and technical superiority of the United States. Nation-states and non-state actors will rely on asymmetric attacks based on development of an unexpected advantage in a specific technical area, deception, concealment, and surprise.

Most likely attacks from a nation-state are diesel submarines, Special Forces, or massive cruise missile and TBM attacks. Diesel submarines are cheap, easily concealed and lethal. They are difficult to locate in the littoral regions and can wait quietly and choose the moment to attack. As discussed in the previous chapter, there are numerous torpedoes available today with the capacity to damage or sink MPF ships.

Proliferation of cruise missiles makes them cheap and easily attainable also. They are easily dispersed because they can be launched from air, land or sea. Targeting such a threat is extremely difficult and similar to dealing with the man portable air defense threat to aviation today. Because cruise missile technology resembles other non-military technology, it is difficult to identify states, which are building massive cruise missile fleets.<sup>115</sup> A massive cruise missile

---

<sup>115</sup> Woodside, slide 45-47.

attack to overload US defense systems and strike a high value target poses a credible threat to MPF shipping. Furthermore, this type of threat forces the U. S. to shoot down \$100,000 cruise missiles with intercept missiles costing about \$800,000 apiece.<sup>116</sup>

Special Forces attacks are another likely approach nation-states may use. They require a relatively small highly trained force. Defending against an attack by Special Forces is difficult because they are small, difficult to detect, they retain the initiative and they know specifically where and what they want to strike.

Non-state actors do not possess the resources of a nation state. These attacks will rely on deception and surprise to deliver one quick devastating blow. Use of explosive laden commercial ships, aircraft and sabotage from boarding parties or swimmers are the most likely types of attack. The attack of the USS Cole on 12 October 2000 is an example of how such an attack may occur. It is also possible to intercept MPF ships just before they reach the SPOD with a large commercial vessel with anti-ship missiles, or which launches small attack boats with boarding parties or explosives. This type of attack requires the adversary to obtain detailed intelligence about the MPF operation. Attacks at this point could result in a temporary delay or a catastrophic loss of an MPF ship.

This analysis indicates that the general vicinity of the SPOD is the most likely point of attack for both nation-states and non-state actors. The lack of organic self-defense makes the current MPF ships vulnerable to asymmetric attacks from borders, Special Forces, anti-ship missiles and cruise missiles. An MPF ship with its own organic sea sparrow missile defense system would have only 35-45 seconds to engage an anti-ship missile from the time it was detected.<sup>117</sup> Without this organic capability, the MPF ships must rely on escorts that may be some distance away and which fail to respond because they are trying to ascertain the true nature of the threat. Asymmetric attacks utilizing deception, such as a commercial ship with anti-ship

---

<sup>116</sup> Barnett, 38.

<sup>117</sup> Calvano, Harney, Weekly, McKerrow, Anderson, 236.

missiles or borders, compress the reaction time of the escorts by creating confusion as to the true nature of the threat.

Any of the attack methods mentioned above may result in the loss or damage to a ship that significantly delays arrival and offload. Loss or delay of a single ship has serious implications for the landing force. Because the cargo is loaded for efficiency and not task organized, loss of a ship may strip the landing force of a particular type of ammunition or a specific capability such as armor or aviation<sup>118</sup>. Such a loss may prohibit combined arms operation and results in a significant delay in reinforcement or sustainment to the initial forcible entry operation. This delay may require the withdrawal of the initial landing force, which jeopardizes future operations in the theater.

### **MPFE**

The enhancement program for MPF operations provides increased capabilities but does not significantly alter the concept of operations or employment. The analysis of current MPF operations is applicable in terms of points and methods of attack. The MPF(E) capabilities allow the MAGTF commander to establish aviation capabilities 7-8 weeks faster than previously anticipated as well as providing the sustainment for an armored brigade. Loss of these significant capabilities would seriously degrade the ability of the United States to project rapidly, credible and sustainable forces into a theater of operations.

### **MPF Future**

The employment of the MPF varies significantly under the MPF Future concept. The MPF Future force does not require a seaport, provides initial sustainment for the MAGTF, and acts as a mobile conduit for sustainment and follow on operations. Currently, the actual

---

<sup>118</sup> Major Richard Williams III, II MEF MPF Officer, "MPF Information" email dated 01 March 2002. Each MPSRON is loaded primarily for efficiency. However, 2 MPF ships the Bobo and the Obregon contain a task organized "MEU Slice" capable of supporting a 2900 man force.

organization and equipment for the MPF future force has not been determined. For the purpose of this monograph, the following assumptions are made: 1. MPF future will have the MAGTF joined and task organized in tactical formation, 2. MPF ships will possess organic self-defense, and 3. a more robust naval escort package will be dedicated to MPF force protection.

The most likely point of attack of the MPF Future force is at the SPOE or in transit if there are identifiable choke points along the route. Currently the MPF ships spend very little time at the SPOE, unless they are undergoing some form of maintenance they are normally at sea with their equipment.<sup>119</sup> It will be very difficult to find them after they leave the SPOE. There is no requirement for a SPOD in the future concept. Utilizing the sea as maneuver space, coupled with over the horizon attack capabilities denies the enemy the ability to template locations of the MPF in the area of operations, consequently reducing the threat from diesel submarines, cheap cruise missiles (300km range) and similar systems.

By conducting the link up of the MAGTF aboard the ATF, and MPF ships at sea, the future concept avoids most of the threats associated with the SPOD. Continually maneuvering the sea based sustainment and support compounds the difficulty of locating the target for adversaries. In essence, by conducting RSOI at sea and operating from over the horizon the adversary is required to develop a force projection capability that can interdict friendly forces in the open ocean. This is an extremely expensive and difficult task and allows the United States to leverage its economic and technological advantages.

The nature of MPF future operations counters many of the threats identified in the previous chapter. The presence of the MAGTF integrated with the MPF effectively eliminates the likelihood of success for SOF or non-state actors attempting to board and sabotage MPF ships.<sup>120</sup>

---

<sup>119</sup> Military Sealift Command, [Homepage online], Available at <http://www.msc.navy.mil/annualreport/2001/pm4.htm>.

<sup>120</sup> Calvano, Harney, Weekly, McKerrow, Anderson, 124.

Adversaries will require detailed intelligence to locate the future MPF force in transit coupled with a force projection capability to interdict those ships on the open ocean. If adversaries can template or identify through intelligence the routes of the MPF ships, it would be possible to engage them with some of the asymmetric attacks previously discussed. Given the organic self-defense, enhanced escort force, and embarked MAGTF the adversaries best chance is to use such forms of deception to create enough confusion to delay response time of the MPF ships to the threat.

Preemptive attacks at the SPOE with ICBMs are possible but unlikely to be effective considering the ships are normally at sea. This type of attack is only effective if some of the ships were in for maintenance.

Unlike current MPF operations, the future concept envisions the force task organized and deployable in tactical formations directly from the MPF base of operations. Consequently, a successful attack results in loss of one part of the overall force instead of the loss of a specific capability to the entire force. This may require a reduction in the number of objectives, delay in execution, reduce long-term sustainment capability, or require sequential vice simultaneous operations. However, unless there were numerous successful attacks, the U. S. would retain the capability to put a credible sustainable force in theater.

## **Summary**

The SPOD is the most likely point of attack because of its frequent proximity to the area of operations. If potential adversaries can locate MPF ships anywhere along the route from SPOE to SPOD, they possess the capability to engage successfully and destroy those assets. The resources and intelligence required to acquire, train, and maintain a relevant force projection capability to launch attacks at the SPOE or in transit are prohibitive for most adversaries.

Asymmetric attacks based on deception, concealment and surprise that degrade our technological advantage are the preferred methods of attack. Successful attacks of MPF shipping

may result in delayed entry of US forces, withdrawal of US forces or strand forces in theater without adequate sustainment. The ability of an adversary to disrupt U. S. involvement in a theater of operations without a significant loss of U. S. lives may provide the political catalyst for a total withdrawal of U. S. forces from the area of operations.

This analysis reveals two inherent vulnerabilities in current MPF operations: a lack of organic self-defense and a lack of task organization and spread loading of cargo. A potential third vulnerability is operational security.

Operational security is compromised because of the predictability of SPODs selection based on current offload requirements and the availability of information. Many automated planning databases provide an enormous amount of information, which, when taken in their entirety, may assist in templating the movements of force projection assets. The Joint Flow and Analysis System for Transportation (JFAST) and Automated Battle book System (ABS) are two examples of automated planning databases, which facilitate easy access. Although none of these databases currently provides all the information necessary to accurately locate MPS ships enroute if the Department of Defense continues to develop automated planning tools and internet access to information it is entirely likely that sensitive information will eventually be compromised.

The MPF future concept, as currently envisioned, adequately addresses the vulnerabilities associated with a lack of organic self defense and the task organization and spread loading of cargo to prevent a complete loss of a critical capability. However, no decisions have actually been made, and it is critical that these vulnerabilities be addressed in the development of the MPF future ships and doctrine. The future concept does not address the potential information security and operational security problem. It is important for planners not to develop a false sense of security and to recognize that if MPF ships can be templated they provide a highly lucrative target for potential adversaries.

## **Conclusions and Recommendations**

### **Introduction**

Despite the technological advantages the U. S. possess, immobile forces will continue to be vulnerable to attack. Given enough time, adversaries will find a way to overcome defensive measures. MPF operations tied to permissive environments that conduct RSOI ashore create a target of opportunity for adversaries. Without operational mobility the MPF force is predictable and vulnerable. Successful attacks will not prevent U. S. intervention, however it may delay entry of U. S. forces long enough for adversaries to achieve their objectives or seek a political solution.

There was no overwhelming response to attacks on U. S. forces overseas such as Somalia on 3 October 1993, Khobar Towers on 25 June 1996, and the USS Cole on 12 October 2000. Somalia may actually reinforce the impression that a small tactical victory is sufficient to force U. S. withdrawal.

To operate throughout the breadth and depth of an area of operations over time, OMFTS requires sea-based sustainment. The current MPF force, although incapable of fully supporting OMFTS, does provide initial sustainment. Future MPF operations will act as a conduit for continued sustainment as well as sea based RSOI. This sustainment is a critical capability to conduct OMFTS.

The MPF ships represent the best opportunity to interdict U. S. force projection capabilities with the least amount of physical and political risk. This analysis indicates that the MPF is a high value target for potential adversaries and appropriate measures must be taken to safeguard this force in the future.

## **Recommendations for Current MPF**

The analysis indicated two inherent vulnerabilities in current MPF operations. The first one is a lack of organic self-defense and the second one is the loading and task organization of the MPF equipment and forces. Information security is a potential third vulnerability.

There are several options available to correct the self-defense deficiency. Budgetary and time constraints influence the selection of a remedy. In an unconstrained environment, the best solution would be as follows. Refit MPF ships with anti-ship missile defense systems such as the sea sparrow. A dedicated Aegis class escort vessel and an organic security force should augment the MPF force. The security force could be modeled after the Fleet Anti-terrorist Strike Teams (FAST) that the Marine Corps currently utilize.

The MAGTF embarked with the ARG should augment the organic self-defense force. In order to facilitate this relationship, the Navy and Marine Corps must begin to conduct extensive training operations requiring the integration of the ARG and MPF. These training operations will form the foundation of the lessons learned necessary to develop doctrine for the integration of these forces at sea.

These recommendations provide the highest level of protection, however, it would take a significant amount of time, money and manpower to refit the ships, conduct the necessary training operations and develop the doctrine for this extensive overhaul to be successful. A scaled down option is to accept a degree of risk now while developing the future MPF ships and doctrine. The scaled down version does not include an organic anti-ship missile system and self-defense force. Under this version, current doctrine must be modified to definitely list the requirements for dedicated escort to MPF ships. Additionally, the scaled down version requires a focus on early integration of the ARG and MPF in order to facilitate protection from the embarked MAGTF. This integration of the ARG and MPF will assist in the development of the lessons learned necessary to create the doctrine for future MPF operations.

Unfortunately, little can be done to correct the vulnerability, which arise from the manner in which the ships are loaded. In order to carry the amount of sustainment supplies necessary to support a MEB for 30 days each MPSRON must be loaded for efficiency. The only exception to this is the two ships that are loaded with the “MEU slice”. Consequently, this vulnerability will continue to exist until the next generation of ships is built.

### **Recommendations for Future MPF**

Although the future MPF is still in its conceptual stage, there are several elements from the current vulnerabilities, which are applicable to the development of the future concept. These recommendations focus on those key vulnerabilities identified above and sea-based sustainment, which is critical to the OMFTS concept.

The future MPF concepts discussed rectify the vulnerability associated with loading and task organization. The future MPF force will be a maneuvering floating sustainment base that conducts arrival and assembly at sea with the MAGTF. From this sustainment base the MAGTF will task organize and depart in tactical formation. Equipment and supplies will be spread loaded throughout the force therefore reducing the chance of a catastrophic loss of an entire capability.

The vulnerability in self-defense still exists. The design of future MPF ships is undecided. It is imperative that this future design includes organic self-defense from anti-ship missiles, small boats and boarding parties. Parallel to the development of these ships, the Navy should increase the size of its escort fleet of Aegis capable ships to facilitate dedicated escort of the MPF.

Classify secret and restrict access to all planning databases such as JFAST and ABS. Information will be a focus of effort for future adversaries. The capability to access U. S. databases in order to locate or template movements of the MPF simply requires a group of dedicated computer hackers. This type of force is easier to develop and cheaper than

sophisticated space-based surveillance systems, radars or other acquisition assets. Consequently, the U. S. must be more restrictive than before with information security.

Sustainment is the Achilles heel of OMFTS. Without the ability to conduct sea-based logistics, OMFTS loses the ability to operate throughout the width, and depth of the area of operations over time. One aspect of the current concept is to reduce demand for supplies ashore by seabasing capabilities such as fire support and command and control.

Another recommendation for reducing demand is to develop a future weapon system that generates its own power and energy directed weapon system thus reducing the demand for class III and Class V supplies. The future combat system should be developed in conjunction with the future MPF ships. Nuclear powered ships travel around the world without refueling. The development of this type of capability for future combat systems would significantly reduce the demand for logistics ashore, facilitate the OMFTS concept, extend operational reach and delay culmination of U. S. forces in theater.

### **MPF and the Future Environment**

The MPF future concept provides a model for a new force structure to meet the challenges of the future operating environment. The United States must leverage its strengths in economics, technology, geography and air and naval superiority while mitigating vulnerabilities associated with fixed bases in order to maintain responsive forces capable of influencing events around the world.

American forces must maintain a forward presence to reinforce the diplomatic instrument of national policy and the strategic responsiveness to remain relevant in a rapidly changing environment. MPF modeled forces are ideal for this type of environment. “The flexibility and

speed afforded by afloat pre-positioning fit perfectly into a strategy requiring quick response to regional crisis.”<sup>121</sup>

This strategy leverages the U. S. advantages in force projection capabilities and protects the vulnerability associated with fixed sites by replacing fixed, forward based forces, with mobile prepositioned forces. In essence, by reducing the high value targets at fixed sites overseas, potential adversaries must develop their own force projection capability to influence the United States. Recent events indicate that this is possible, however, it is considerably more difficult than striking targets closer to them. This mobile forward presence strategy also possesses a political and informational perception management component, by reducing the impression that the U. S. is a territorial imperialistic power associated with maintaining large land armies on foreign soil. This is not a policy of isolation. A strategy of naval forward presence facilitates diplomatic engagement and a greater presence with more nations.

Technological advantages already facilitate conducting many operational functions from inside the continental United States. Unlike Operation Desert Storm, CENTCOM is currently fighting most of the war in Afghanistan from the United States. Colonel Barnett suggests this concept in his book *Future War*, when he illustrates the logic of placing the JFACC in CONUS. His analysis indicates that current technology supports the concept for the JFACC and possibly other functional commanders, as well as reducing the vulnerability of such high value command and control nodes.<sup>122</sup> Current Expeditionary Maneuver Warfare concepts envision seabasing many functions to reduce the footprint of the landing force. If significant parts of the command and control function are based in CONUS, it reduces the overall size of the MPF force. This creates a smaller force tailored to fight engagements as part of a larger operational design controlled from outside the theater of operations. This concept is relevant to the Army’s Objective Force, Unit of Action and Unit of employment concepts. Reducing the size of the force

---

<sup>121</sup> Conrad, 57.

<sup>122</sup> Barnett, 60.

to reflect only the fighting elements reduces the footprint, logistics requirements and present a smaller target for adversaries to locate.

A naval expeditionary force consisting of a MEB sized amphibious task force with its own organic MPF future ships and dedicated surface, subsurface and carrier support is necessary for this type of mobile forward presence. This force structure provides a credible, sustainable force that is ideal for a regional crisis. With three such forces, the United States could place one or two MEB sized forces almost anywhere in the world within seven days. Additional flexibility and forward presence is accomplished with six naval expeditionary forces continuously afloat. This would require a force structure capable of supporting between 9 and 18 of these naval expeditionary forces following a training, executing, maintenance stand down cycle of 6 months each.

The reduction in forces based overseas could help offset the cost and support this notional naval expeditionary force structure. The Marine Corps is incapable of manning this notional structure. The Army must designate a portion of the objective force to support this concept and jointly develop the future MPF with the Navy and Marine Corps. To provide flexibility to operational planners, the army must retain other forcible entry capabilities and the ability to conduct decisive ground operations for major theater wars.

This concept provides a viable, lethal, and sustainable force over time with organic self-defense and the strategic agility to pre-empt situations as referenced in MG Scales' *Future Warfare*.<sup>123</sup> The MPF future is a critical component to a future concept predicated on the strategic defensive combined with tactical and operational offensive capabilities in the form of

---

<sup>123</sup> MG Robert H. Scales Jr., ed., *Future Warfare* (Carlisle Barracks, PA: U.S. Army War College, 1999), 89. MG Scales refers to utilizing space to achieve the strategic speed to preempt enemy actions on the battlefield. The battlefield force would only require things that kill, sense or fuse information and the other required forces such as command and control could be placed outside the battle area. This concept of preemption fits well with the Naval Expeditionary Force outlined above.

precision strike from afar and strategically responsive forces capable of preempting or defeating regional aggressors.

### **Summary**

This monograph concludes that current MPF operations possess two inherent vulnerabilities and regardless of these vulnerabilities; current MPF operations do not support the OMFTS concept.

The MPF future concept, still in development, addresses the vulnerabilities associated with the current MPF in terms of task organization and spread loading of equipment and to some degree the vulnerability associated with organic self-defense. Information security must be addressed throughout the DOD, particularly concerning planning databases, to prevent the development of this issue into a critical vulnerability. Consequently, there is no inherent vulnerability currently identified with the MPF future concepts, which invalidates the OMFTS concept.

## Appendix A

This Appendix provides a list of force protection elements available to augment the MPF force protection organization.

Excerpt from MCWP 3-32 (Final Draft) Maritime Prepositioning Force Operations:

### **5004. Force Protection Elements**

Depending upon the tactical situation and the threat, a variety of force protection elements may be tasked with providing security measures during the marshalling, movement, and arrival and assembly phases of MPF operations. The establishing authority and FPO should consider the assets in this section as a shopping list from which the optimum force protection package can be assembled and organized.

#### **a. Situational Awareness**

There are many assets available to provide the establishing authority and the force protection organization with situational awareness of the battlespace. Some of the key assets are described below.

##### **(1) Mobile Inshore Undersea Warfare Radar-Sonar Surveillance Center**

One of mobile inshore undersea warfare's (MIUW) key functions is maritime situational awareness. The Radar-Sonar Surveillance Center (RSSC) provides a fused tactical picture from various maritime surveillance sensors, including surface search radars, acoustic sensors, an ESM system, and remotely-operated thermal and visual imaging systems. The organic tactical picture is reported via JMCIS-generated over-the-horizon (OTH) Gold reports to other JMCIS-equipped units in order to promote a common awareness of the tactical situation.

##### **(2) Surface Pickets**

Surface pickets use a variety of onboard maritime surveillance sensors, including surface and air search and fire control radars, ESM systems, optical systems, and passive and active sonar systems to develop and maintain an integrated tactical picture. Embarked helicopters may also be used to extend a ship's surveillance battlespace. Some ships are equipped with combat Direction Finding (DF) or a ship's signals exploitation space (SSES) which provides additional sensor input to the ship's total contact picture. Combat direction systems, JMCIS and associated tactical data links are used to exchange track data with other similarly equipped units to promote a common awareness of the tactical situation. In addition to escort functions, surface ships can be employed as surveillance pickets to extend the surveillance area beyond the approaches to the AAA.

##### **(3) Maritime Patrol Aircraft**

Maritime patrol aircraft (MPA) use a variety of onboard maritime surveillance sensors, including surface search and inverse synthetic aperture radar (ISAR), electronic surveillance measures (ESM) systems, optical systems, and passive and active acoustic sensors to develop and maintain an integrated tactical picture. This tactical picture is communicated to other units via Naval Tactical Data System (NTDS), as well as tactical voice radios. MPA can conduct surface and

subsurface coordination flights to extend the surveillance area beyond the approaches to the AAA.

#### **(4) Non-organic Assets**

There are a variety of theater and national general service (GENSER) messages and sensitive compartmented information (SCI) surveillance assets, which may be tasked with supporting CMPF C4ISR functions. These sensors can provide imagery intelligence (IMINT), electronics intelligence (ELINT), communications intelligence (COMINT), and measurement and signature intelligence (MASINT) products and analysis to augment maritime surveillance and queue tactical sensors.

#### **(5) SH-2G Helicopters**

SH-2G helicopters can be shore-based in the AAA and tasked with searching the sea surface (Q-route) with optical/ thermal equipment called Magic Lantern.

#### **(6) Landward Surveillance Sensors**

Landward surveillance sensors include hand-held and mounted night vision/thermal imaging systems, ground acoustic and seismic sensors, sniper scopes, and various tripwire and flare systems. The systems are deployed by the LSO to provide early detection of potential landward threats and are usually organized into listening posts/observation posts (LP/OP).

### **b. Command and Control**

The primary C2 assets available to the establishing authority and his subordinate force protection commanders are described below. These assets are used to direct and coordinate surveillance activities and security responses.

#### **(1) Connectivity Assets**

The establishing authority's C2 connectivity assets will normally be task-organized from the parent organization from which the establishing authority originates.

#### **(2) Mobile Ashore Support Terminal**

The MAST is the CMPF's C2 hub, and is sourced from the NCW's harbor defense command unit and mobile in-shore undersea warfare unit. Its primary capabilities include a tactical C2 system (i.e., JMCIS), and tactical intelligence system (i.e., JDISS), and tactical and long haul voice and data communications systems (i.e., UHF, VHF, HF, and SHF). JMCIS provides a common tactical display and the means to coordinate actions with other JMCIS-equipped forces, as well as the naval component commander. JDISS provides a demand-pull intelligence support capability to facilitate queuing tactical surveillance sensors to potential threats approaching the AAA, as well as to support planning for follow-on CMPF missions. The communications suite includes tactical secure voice and data for controlling force protection assets, record message processing systems (e.g., CUDIXS and NAVMACS II), and an SHF SATCOM system, which provides reach-back capabilities to support JDISS operations and mission planning.

### **(3) Mobile Inshore Undersea Warfare Radar-Sonar Surveillance Center**

One of the mobile inshore undersea warfare (MIUW) radar-sonar surveillance center's (RSSC's) key functions is command and control. The RSSC's fused tactical picture provides the primary capability for the tactical control and direction of maritime interdiction assets in the AAA. The organic tactical picture is maintained on two graphical data fusion system workstations, as well as on a JMCIS workstation. Thermal and visual imaging system CRT displays support the tactical control of small boat interdiction assets, as well as contact identification. The RSSC's communications suite includes tactical secured and unsecured voice and data UHF, VHF and HF capabilities for controlling maritime interdiction assets.

### **(4) MAGTF Arrival and Assembly Operations Group**

The arrival and assembly operations group (AAOG) provides a full array of communications connectivity for the MAGTF Commander during arrival and assembly operations.

### **(5) Surface Ship Combat Information Center**

The combat information center (CIC) in each of the surface ships conducting escort protection for the MPSRON and seaward force protection in the AAA provides the CMPF a primary source of intelligence information and C2 capability.

## **c. Seaward Security Response**

The Naval Coastal Warfare unit is the force protection integrator for the SSOC. The NCW is a combined Navy and Coast Guard command; with select units assigned to Naval and Coast Guard reserve centers. Some of the elements that may comprise the NCW are described below.

### **(1) Secure and Unsecured Tactical Communications Systems**

The RSSC provides the SSO with situational awareness and a tactical plot from which to direct and control seaward security and interdiction assets. The RSSC contains a variety of secure and unsecured tactical communications systems with which to coordinate the employment of interdiction assets. The SSO normally has TACON of inshore boat units (IBU), port security units (PSU), and/or host nation small boat assets.

### **(2) Inshore Boat Units**

Inshore boat units (IBUs) are small boat units that have two twin-diesel engine-powered Boston whalers armed with machine guns. The boats are used to conduct visit, board, search, and seizure (VBSS) operations. IBUs are normally under TACON of the MIUWU.

### **(3) Coast Guard Port Security Units**

Coast Guard port security units (PSUs) have six Boston Whalers armed with machine guns. The boats are used to conduct VBSS operations. PSUs also have a Maritime Security (MARSEC) component, which supports perimeter/access control and landward security response measures. PSU's may be under TACON of the NCW/MIUWU.

### **(4) Explosive Ordnance Disposal Mobile Unit Detachment**

When assigned, an explosive ordnance disposal (EOD) mobile unit detachment conducts hull surveys, mine searches of the MPF vessels (in port/at anchor), and supports anti-swimmer defense measures through use of marine mammals.

**(5) Host Nation Assets**

Host Nation assets are country-dependent and can include PKMs, LCM-8s, PCs, and other small surface craft capable on VBSS and interdiction operations. The NCW and /or MIUWU may or may not have TACON of host nation assets.

**(6) Maritime Patrol Aircraft**

Maritime patrol aircraft (MPA) provide over-the-horizon surface/subsurface surveillance in the AAA. MPA also can conduct coordinated anti-ship and anti-submarine attacks, depending upon armament.

**(7) Shore-Based Helicopters**

Shore-based helicopters can operate as anti-submarine assets and respond to surface contacts in the operational area.

**(8) Surface Mine Counter-Measures**

Surface mine counter-measure ships conduct mine sweeping in the approaches to the harbor/port facility before and during MPF operations in order to establish and maintain Q-routes through the AAA.

**(9) Airborne Mine Counter-Measures**

Airborne mine counter-measure helicopters conduct mine sweeping in approaches to the harbor/port facility before and during MPF operations in order to establish and maintain Q-routes through the AAA.

**d. Landward Security Response**

Landward security response forces will be assigned based on the threat. In addition to ground and air combat forces, a variety of supporting elements may be deployed and integrated into the landward defenses of the AAA by the LSO, such as Military Police, EOD personnel, K-9 patrol dogs, stinger batteries, host nation police and physical security elements, USMC force protection sub-teams, and Naval Criminal Investigative Service personnel.<sup>124</sup>

---

<sup>124</sup> MCWP 3-32, *Maritime Prepositioning Force Operations*, 5-5-5-8.

## Appendix B

Excerpt from MCWP 3-32 (Final Draft) Maritime Prepositioning Force Operations:

The following list of potential threats to MPF operations in the AAA and is provided to assist planners in developing force protection measures. Note that this is not a comprehensive guide to all potential threats; counter-intelligence and intelligence sources should be solicited to provide tailored threat assessments for the designated AAA and its approaches prior to and during MPF operations.

**Sabotage:** Generally a small explosive device smuggled on board an MPF ship to destroy vital shipboard system and/or stored equipment and supplies

**Light aircraft:** Small manned aircraft capable of eluding air defense radars and equipped with small bombs and/or missiles. Light aircraft may be explosive-laden for a suicide mission

**Combat swimmers:** Frogmen with snorkeling and/or self-contained breathing apparatuses who carry mines and/or small torpedoes

**Small surface craft:** Swift surface craft of less than 100 feet in length which can carry a combination of hand-held or shoulder-fired missiles, heavy automatic weapons, rockets, and small arms. These craft can also be used for mine laying and to insert combat swimmers into the AAA

**Mines:** Magnetic- pressure- acoustic- and contact-influenced explosive devices which can be moored, buried or adrift in deep, shallow, or very shallow water or surf zones

**Diesel submarines:** Small to medium submersibles and semi-submersibles capable of carrying combat swimmers, torpedoes and mines. Includes midget and mini-submarines

**Car/truck bombs:** Generally large, vehicle-transported explosive devices

Boarders

Piracy

Portable missiles

Harassment: Planned demonstrations, civil unrest, etc.<sup>125</sup>

---

<sup>125</sup> MCWP 3-32, *Maritime Prepositioning Force Operations* 5-9.

## BIBLIOGRAPHY

### Books

- Barnett, Jeffery R. *Future War An Assessment of Aeropsace Campaigns in 2010*. Maxwell Air Force Base, AL: Air University Press, 1996.
- Conrad, Scott W. *Moving The Force Desert Storm and Beyond*. National Defense University. Washington, D.C.: U.S. Government Printing Office, 1994.
- Hura, Myron and Richard Robinson. *Fast Sealift and Maritime Prepositioning Options For Improving Sealift Capabilities*. Santa Monica, CA: RAND, 1991
- Kassig, David. *Getting U.S. Military Power to The Desert: An Annotated Briefing*. Santa Monica, CA: RAND 1992
- Matthews, Col Lloyd J. ed., *Challenging the United States Symmetrically and Asymmetrically: Can America be Defeated?* Carlisle Barracks, PA: U. S. Army War College, 1998.
- Matthews, James K. and Cora J. Holt. *So Many, So Much, So Far, So Fast: United States Transportation Command and Strategic Deployment for Operation Desert Shield/Desert Storm*. Washington, D.C.: U.S. Government Printing Office, 1996
- Menarchik, Douglas. *Powerlift: Getting to Desert Storm: Strategic Transportation and Strategy in The New World Order*. Westport, CT: Praeger, 1993
- Naveh, Shimon. *In Pursuit of Military Excellence*. London: Cass, 1997.
- Newell, Clayton R. *The Framework of Operational Warfare*. New York: Routledge, 1991.
- Scales Jr., MG Robert H. *Future Warfare*. Carlisle Barracks, PA: U. S. Army War College, 1999.
- Simpkin, Richard, *Deep Battle The brainchild of Marshal Tukhachevskii*. Oxford: Brassey's Defence Publishers, 1987.
- Steeb, Randall, John Matsumura, Terrell Covington, Thomas Herbert and Scott Eisenhard. *Rapid Force Projection: Exploring New Technology Concepts for Light Airborne Forces*. Santa Monica, CA: RAND 1996.
- Steeb, Randall, John Matsumura, Terrell Covington, Thomas Herbert, Scott Eisenhard and Laura Melody. *Rapid Force Projection Technologies: A Quick –Look Analysis of Advanced Light Indirect Fire Systems*. Santa Monica, CA: RAND 1996.
- Story, William C. *Third World Traps and Pitfalls: Ballistic Missiles, Cruise Missiles, and Land Airpower*. Maxwell AFB, AL: Air University Press, 1995
- Tellis, Asheley J., Janice Bially, Christopher Layne, Melissa McPherson, and Jerry M. Sollinger, *Measuring National Power in the Postindustrial Age*. Santa Monica: Rand, 2000.

Triandafilov, V.K. *The Nature of Modern Armies*. Edited by Jacob W. Kipp, translated by William A. Burhans. Portland: Frank Cass, 1994.

### Government Documents

Department of the Navy. Office of the Chief of Naval Operations, Strategic Sealift Division, OP-42. Strategic Sealift Program Information. Washington, D.C.: April 1985

\_\_\_\_\_. Office of Naval Intelligence. Challenges to Naval Expeditionary Warfare. Washington, D.C.: 1997.

General Accounting Office National Security and International Affairs Division. Military Afloat Prepositioning: Wartime Use and Issues for the Future. Washington, D.C.: U. S. General Accounting Office, 1992.

\_\_\_\_\_. Desert Shield/Storm. Air Mobility Command's Achievements and Lessons for the Future. Washington, D.C.: U. S. General Accounting Office, 1993.

\_\_\_\_\_. Military Prepositioning: Army and Air Force Programs Need to Be Reassessed. Washington, D.C.: U. S. General Accounting Office, 1998.

Quilter, Charles J. U.S. Marines in the Persian Gulf, 1990-1991: With the I Marine Expeditionary Force in Desert Shield and Desert Storm. Washington D.C.: Headquarters, U.S. Marine Corps, History and Museums Division, 1993.

US Army. FM 3.0, Operations. Washington D.C.: Department of the Army, June 2001.

US Department of Defense. Evaluation Report, The U. S. Marine Corps Maritime Prepositioning Force Enhancement Program. Arlington, VA: Inspector General, Department of Defense 1995. Accessed from the internet at <http://www.dtic.mil/doctrine/jpreferencepubs.htm> on January 02.

\_\_\_\_\_. Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms. Washington D.C.: U.S. Government Printing Office, 2001. Accessed from the internet at <http://www.dtic.mil/doctrine/jpreferencepubs.htm> on 14 January 02.

\_\_\_\_\_. Joint Publication 3-0. Doctrine for Joint Operations. Washington D.C.: U.S. Government Printing Office, 1995.

\_\_\_\_\_. Joint Publication 3-02. Joint Doctrine for Amphibious Operations. Washington D.C.: U.S. Government Printing Office, 2001. Downloaded loaded from the internet At <http://www.dtic.mil/doctrine/jpoperationsseriespubs.htm> on 09 January 02.

US Marine Corps. Operational Maneuver From The Sea. Quantico: Marine Corps Combat Development Command, Concepts Division, 1996. Downloaded loaded from the internet at <http://www.concepts.quantico.usmc.mil/omfts.htm> on 26 September 01.

\_\_\_\_\_. Ship-To-Objective Maneuver. Quantico: Marine Corps Combat Development

Command, Concepts Division, 1997. Downloaded from the internet at <http://www.concepts.quantico.usmc.mil/stom.htm> on 26 September 01.

- \_\_\_\_\_. Maritime Prepositioning Force 2010 and Beyond. Quantico: Marine Corps Combat Development Command, Concepts Division, 1997. Downloaded from the internet at <http://www.concepts.quantico.usmc.mil/mpf.htm> on 26 September 01.
- \_\_\_\_\_. The Marine Air Ground Task Force in Sustained Operations Ashore. Quantico: Marine Corps Combat Development Command, Concepts Division, 1998. Downloaded from the internet at <http://www.concepts.quantico.usmc.mil/soa.htm> on 26 September 01.
- \_\_\_\_\_. Sea Based Logistics. Quantico: Marine Corps Combat Development Command, Concepts Division. 1998. Downloaded from the internet at <http://www.concepts.quantico.usmc.mil/sbl.htm> on 26 September 01.
- \_\_\_\_\_. Concepts and Issues 2000. Leading the Pack in a New Era. Washington D.C.: Headquarters, U.S. Marine Corps Programs and Resources Department, 2000.
- \_\_\_\_\_. Marine Corps Strategy 21. Washington D.C.: Headquarters U.S. Marine Corps, 2000
- \_\_\_\_\_. Expeditionary Maneuver Warfare Marine Corps Capstone Concept. Washington D.C.: Headquarters U.S. Marine Corps, 2001.
- \_\_\_\_\_. Marine Corps Doctrinal Publication 1, Warfighting. Washington D.C.: U.S. Government Printing Office, 1997.
- \_\_\_\_\_. Marine Corps Doctrinal Publication 1-0, Marine Corps Operations. Washington D.C.: U.S. Government Printing Office, 2001.
- \_\_\_\_\_. Marine Corps Doctrinal Publication 1-1, Strategy. Washington D.C.: U.S. Government Printing Office, 1997.
- \_\_\_\_\_. Marine Corps Doctrinal Publication 1-2, Campaigning. Washington D.C.: U.S. Government Printing Office, 1997.
- \_\_\_\_\_. Marine Corps Doctrinal Publication 1-3, Tactics. Washington D.C.: U.S. Government Printing Office, 1997.
- \_\_\_\_\_. Marine Corps Doctrinal Publication 3, Expeditionary Operations. Washington D.C.: U.S. Government Printing Office, 1998.
- \_\_\_\_\_. Marine Corps Doctrinal Publication 4, Logistics. Washington D.C.: U.S. Government Printing Office, 1997.
- \_\_\_\_\_. Marine Corps Doctrinal Publication 5, Planning. Washington D.C.: U.S. Government Printing Office, 1997.
- \_\_\_\_\_. Marine Corps Doctrinal Publication 6, Command and Control. Washington D.C.: U.S. Government Printing Office, 1997.

\_\_\_\_\_. Marine Corps Warfighting Publication 3-32, Maritime Prepositioning Force Operations (Final Draft April 2000). Washington D.C.: U.S. Government Printing Office, 2000. Downloaded from the internet at <http://www.doctrine.quantico.usmc.mil/> on 19 Sept 2001.

Warfighting Study Group, Strategic Studies Institute. *The Operational Art of Warfare Across the Spectrum of Conflict*. Carlisle Barracks: U.S. Army War College, 1987.

#### Periodicals, Publications and Articles

Albrecht, Chuck. "Right place, right time." *Marines Vol.25 Issue 8* (August, 1996): 16-18.

Baur, Gregory J. "The Case for Seaplanes: A Fresh Look at an Old Tool for OMFTS Sustainment." *Marine Corps Gazette* (May, 2000): 63-65.

Fuentes, Gidget. "A 'floating dump'? Think again." *Navy Times* (November 4, 1996): 27-29.

Gauthier, Rodney. "Maritime Prepositioning Force's promise to equip Marines...anywhere in the world." *Marines Vol. 27 Issue 8* (August, 1998): 12-14.

Giannetti, Michael. "Using Merchant Ships for Rapid Response." *Marines Vol. 26 Issue 9* (September, 1997): 15-16.

Huff, David. "Situation Report: The MPF Ships." *Seapower Magazine* (November, 2001): p. 2. Available from the Internet online [http://www.navyleague.org/seapower\\_mag/nov2001/situation\\_report.htm](http://www.navyleague.org/seapower_mag/nov2001/situation_report.htm), [15 Jan 02].

Krulak, Charles, "Operational Maneuver From The Sea." *Joint Force Quarterly 21* (spring 1999): 78-86

Krulak, Charles, "MPF 2010 and Beyond. A Concept for the Conduct of Maritime Prepositioning Operation in the 21<sup>st</sup> Century." *Marine Corps Gazette* (February 1998): A-1-A-6

Laqueur, Walter, "Postmodern Terrorism." *Foreign Affairs* Volume 75 No. 5 (September / October 1996): 24-36.

Matthews, William. "Breakdown of gulf-bound ships sparks overhaul of sealift unit." *Air Force Times* (January 1995): 16-17.

Metzinger, Erin M. "Prepositioning as a Joint Undertaking: Military Sealift Command's Afloat Prepositioning Force." *Marine Corps Gazette* (August, 1997): 12-15.

Skipper, Col, Charles O. and Maj. Robert R. Ruark. "Agile Sword." *Marine Corps Gazette* (June, 1995): 16-20.

"Enhanced Maritime Prepositioning Force Update." *Marine Corps Gazette* (April 2000): 7.

Monographs, Theses, Reports and Unpublished Articles

- Bence, Christopher J. "Bedding Down with C-O-T-S Leveraging Commercial Industry to Solve The Strategic Airlift Shortfall." School of Advanced Airpower Studies, Air University, 2000.
- Bessent, E. V. "U.S. Strategic Sealift Capability Study." Army War College, Carlisle Barracks, PA. April 1991.
- Calvano, C. N., Harney, R.C., Weekly, R., McKerrow, G., Anderson, T., "The Maritime Preposition Force Ship 2010." Naval Post Graduate School, Monterey, CA. April 1999.
- Fulkerson, M. B. "Integration of Naval Forces into the Early Entry Theater Level Model (EETLM)." Naval Postgraduate School, Monterey, CA. September 1994
- Haslam, LtCol Anthony M. "Operational Maneuver From the Sea: A Counter to Area Denial in the 21<sup>st</sup> Century." Naval War College, Newport, RI. May, 1999.
- Kroesen, Frederick J. "Strategic Mobility: Getting There Is The Big Problem." Institute of Land Warfare, Association of the United States Army, 1989.
- Martin, J. "Maritime Prepositioning Programs; Combatant Commander's Force Equalizer and Logistical Lifeblood." Naval War College Newport, RI. June, 1996.
- Rubitsky, S. E. "Strategic Lift and the Force Projection Army. Getting the Most from the Least." School of Advanced Military Studies, U.S. Army Command and General Staff College. May 2000.
- Schneider, James J. "The Theory of Operational Art." Theoretical Paper Number 3, School of Advanced Military Studies, U.S. Army Command and General Staff College, 1988.
- \_\_\_\_\_. "Vulcan's Anvil: The American Civil War and the Emergence of Operational Art." Theoretical Paper Number 4, School of Advanced Military Studies, U.S. Army Command and General Staff College, 1991.
- Siebe, LtCol M.A. "Force Protection of Sea Based Logistics, A Historical Perspective." Naval War College Newport RI. May, 1999.
- Tiberi, Paul and James C Wendt. "Gathering the Storm: Contingency Planning and Force Projection." Institute of Land Warfare, Association of the United States Army, 1991.
- Wilson, LCDR Tim. "The ARG as a Self-Contained Force Package: Reconfiguring the ARG to Provide Adequate Organic Self Protection Capabilities." Naval War College. Newport, RI. February 2000.
- Woodside, Robert E. "Feasibility of Third World Advanced Ballistic & Cruise Missile Threat Volume 2." National Defense Industrial Association. Arlington, VA June, 2000.