NPS-AM-10-012

ACQUISITION RESEARCH SPONSORED REPORT SERIES

Analysis of Vessels and Acquisition Methods Utilized to Support Maritime Irregular Warfare

27 May 2010

by

MAJ William Clark, USA,

LT Christopher Kelley, USN, and

LT Justin M. Bummara, USN

Advisors: Dr. Keenan Yoho, Assistant Professor, and

RADM James B. Greene, USN (Ret.), Acquisition Chair

Graduate School of Business & Public Policy

Naval Postgraduate School

Prepared for: Naval Postgraduate School, Monterey, California 93943

ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL

The research presented in this report was supported by the Acquisition Chair of the Graduate School of Business & Public Policy at the Naval Postgraduate School.

To request Defense Acquisition Research or to become a research sponsor, please contact:

NPS Acquisition Research Program
Attn: James B. Greene, RADM, USN, (Ret)
Acquisition Chair
Graduate School of Business and Public Policy
Naval Postgraduate School
555 Dyer Road, Room 332
Monterey, CA 93943-5103
Tel: (831) 656-2092
Fax: (831) 656-2253
e-mail: jbgreene@nps.edu

Copies of the Acquisition Sponsored Research Reports may be printed from our website www.acquisitionresearch.org

ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL

Abstract

As the US military continues to align the appropriate platforms for conducting maritime irregular warfare (MIW), US Special Operations Command (USSOCOM) has leased/chartered civilian ships to provide the appropriate vessels needed to support operations in Operation Enduring Freedom–Philippines (OEF–P). The framework of this study showcases three specific vessels with their corresponding capabilities on a cost-per-day basis. Our findings and analyses may aid commanders in determining the most appropriate vessel as well as the most cost-effective acquisition method to accomplish specific MIW missions in not only OEF–P, but also other MIW environments. Based on the analysis and recommendations presented in this project, decision-makers in this arena will have a mechanism from which to make a more informed decision regarding the acquisition of vessels supporting MIW. Decision-makers will be able to evaluate various potential MIW scenarios, identify specific vessel capabilities in order to meet their operational requirements, and acquire vessels more cost effectively based on total daily-rate costs.

Keywords: Maritime Support Vessel, Maritime Irregular Warfare, Naval Special Warfare, Leasing, Chartering, USSOCOM, Operation Enduring Freedom–Philippines, SOF, SEALs, HSV, LCS, Military Sealift Command

THIS PAGE INTENTIONALLY LEFT BLANK

Acknowledgments

We extend our sincere gratitude to several individuals who supported us in this project. First, we would like to thank our advisors, Dr. Keenan Yoho and RADM James Greene (Ret.), for their guidance, insight, and countless hours of support. Special thanks go to LCDR Glenn Hopson, Naval Special Warfare Command N-85, for his assistance in our research. Without his patience in answering our countless questions and the access he provided, this project would have been incomplete. We would also like to thank CAPT Jeff Kline (Ret.), CAPT Wayne Hughes (Ret.), and COL Jeff Appleget (Ret.), Naval Postgraduate School; Dr. Dick Hoffmann and Dr. Paul DeLuca, RAND Corporation; Mr. Steve Armstrong, US Special Operations Command; Mr. Rusty Bishop and Ms. Juanita Broennimann, Military Sealift Command; and Mr. Kevin Mooney, Naval Special Warfare Group 4, for their immeasurable contributions to this project. Finally, we wish to thank Ms. Karey Shaffer and the staff of the Acquisition Research Program for sponsoring and assisting with this project.

THIS PAGE INTENTIONALLY LEFT BLANK

About the Authors

William J. Clark, Major, Infantry, United States Army, earned an MBA at the Naval Postgraduate School (NPS) in June 2010. Prior to acceptance at NPS, Major Clark served as the Commander of A Company, 1st Battalion, 15th Infantry Regiment at Fort Benning, Georgia. Major Clark earned a Bachelor of Arts degree from Northern Illinois University and a Master's of Science degree from Troy University.

Christopher Kelley, Lieutenant, SEAL, United States Navy, earned an MBA at the Naval Postgraduate School (NPS) in June 2010. Prior to acceptance at NPS, LT Kelley served as a Platoon Commander at SEAL Delivery Vehicle Team ONE at Pearl City, Hawaii. LT Kelley earned a Bachelor of Science degree in Business Administration with an emphasis in finance and economics from Old Dominion University.

Justin M. Bummara, Lieutenant, SWO, United States Navy, earned an MBA at the Naval Postgraduate School (NPS) in June 2010. Prior to acceptance at NPS, LT Bummara completed a 13-month Individual Augmentation tour with Joint CREW Composite Squadron One (JCCS-1) and 4th Brigade Combat Team, 3rd Infantry Division, in Iraq. LT Bummara earned a Bachelor of Science degree in Business Administration with an emphasis in management from Norwich University.

THIS PAGE INTENTIONALLY LEFT BLANK

NPS-AM-10-012

ACQUISITION RESEARCH SPONSORED REPORT SERIES

Analysis of Vessels and Acquisition Methods Utilized to Support Maritime Irregular Warfare

27 May 2010

by

MAJ William Clark, USA,

LT Christopher Kelley, USN, and

LT Justin M. Bummara, USN

Advisors: Dr. Keenan Yoho, Assistant Professor, and

RADM Jim Green, USN (Ret.); Acquisition Chair

Graduate School of Business & Public Policy

Naval Postgraduate School

THIS PAGE INTENTIONALLY LEFT BLANK

Table of Contents

Executive Summary

As the US military increasingly focuses more of its attention on irregular warfare (IW), each of the Services is struggling with how they can best leverage their resources and capabilities to address current and emerging asymmetric threats. An increasingly stressed budget requires the Navy and the other Services to think about acquisition in more untraditional ways than ever before. Unfortunately, big and expensive platforms tend to be the commonly chosen solution to prosecute contemporary and future conflicts. This fixation on relatively few large and costly platforms, or on units that are organized to wage big wars, has proven difficult to adapt to effectively confront smaller asymmetric and irregular threats.

As the United States military continues to align the appropriate platforms for conducting maritime irregular warfare (MIW), US Special Operations Command (USSOCOM) has leased/chartered civilian ships to provide the appropriate vessels needed to support operations in Operation Enduring Freedom–Philippines (OEF–P). Different vessels have been utilized for this mission to meet the shifting requirements of not only the combatant commanders but also those of the Philippine Government.

The primary questions addressed in this study are as follows:

Are leased/chartered ships meeting the requirements to best support MIW?

What is the most appropriate mechanism for acquiring vessels to support MIW?

Using the experience gained in the Philippines during OEF–P as a baseline model, we explored the capabilities of potential vessels relative to the requirements in potential MIW environments, and we investigated those acquisition methods most appropriate for obtaining vessels. This study recommends the most effective vessels, in terms of cost and performance, to accomplish specific MIW missions and identifies the most effective acquisition method to meet those needs. Although we

focus on the Philippines as a baseline case, we ultimately lay out three potential vessels for MIW and state how they would or would not be effective in a range of scenarios—one of which we have exercised through a wargame and for which we have observable data due to ongoing operations.

Although MIW is not currently defined in naval or joint-military doctrine, in simple terms it is the maritime component of irregular warfare (IW) or IW conducted from or on a body of water. Figure 1 identifies five fundamental IW operations as they relate to the maritime environment and domain.

Maritime Irregular Warfare Activities
Security Force Operations & Assistance
Civil-Military Assistance
Counter-terrorism/piracy/narcotics
Building Maritime Partner Capability & Capacity
Intelligence, Surveillance & Reconnaissance

Figure 1. Maritime Irregular Warfare Activities

Figure 2 identifies operations, tactics, and activities comprising MIW from the friendly, or US, side and from the enemy's side. These operations and tactics have been long utilized by both the US and its adversaries and are likely to continue to be used in the foreseeable future. Since there is not a ready definition of MIW, the activities listed below quickly identify activities that should likely be included in a broad definition of MIW and establish a framework of MIW for our continuing research on vessels utilized to support MIW.

Friendly Operations, Tactics, & Activities Comprising MIW	Enemy Operations, Tactics, & Activities Comprising MIW
Show of Force: providing conspicuous naval forces to deter aggression	Hit-and-run attacks by small boats
Maritime Interdiction Ops (MIO) & Visit, Board, Search and Seizure Ops (VBSS)	Maritime suicide attacks using light fiberglass boats
Maritime mobility in support of Special Operations and agencies	Frogmen to sink opponent's vessels
Sea-based forces afloat in support of operations ashore	Smuggling of equipment/drugs on various vessels
Maritime raids; hit-and-run attacks by small boats; frogman ship attacks	Piracy and hijacking of vessels
Intelligence, Surveillance, and Reconnaissance (ISR) of areas of interest ashore	Intelligence, Surveillance, and Reconnaissance
Training, advising, and assisting partner nations' maritime forces (proxies)	Invasion of territory via maritime routes
Civil affairs and construction activities to develop maritime infrastructure	Financial payments or civil support to local populace
Humanitarian assistance and disaster relief from a sea base or at sea	Humanitarian assistance at sea

Figure 2. Friendly and Enemy Components of Operations, Tactics, & Activities Comprising Maritime Irregular Warfare
(DeLuca & Hoffmann, 2010)

The case of OEF–P is a contemporary example of MIW and since the majority of the insurgency takes place in the Sulu Archipelago region of the Philippines, these operations require a significant maritime component to constantly adapt to the evolving operational environment. As a result, three different types of martitime support vessels have been previously or currently assigned to Task Force Archipelago to support the Philippine Naval Marines and SEALs in conducting their operations.

Specifically in OEF–P, maritime forces are used to support and sustain distributed US outposts that are seeking to secure the local population and conduct civil-military operations. These operations include logisitcs and intelligence support as well as an Afloat Forward Staging Base (AFSB) or operating base. They also include providing maritime quick reaction-force deployment and support training of AFP soldiers and security forces. A vessel that supports maritime forces operating in this irregular environment needs to be able to act as a forward-staging base, provide maritime mobility, refuel and rearm small crafts such as the Naval Special Warfare (NSW) 11-meter Rigid-Hull Inflatable Boat (RHIB) and the MKV Special Operations Craft (SOC), and provide a platform for maritime-security and humanitarian-assistance planning and operations. The overarching task of US maritime forces has been to build capacity among the Armed Forces of the Philippines (AFP), Naval Marines, and SEALs through training, equipping, and operational support. With this task in mind, the US has utilized various maritime-support vessels throughout OEF–P, relying on lease/charter agreements and vessels of opportunity to provide direct logistics and employment support to SOF operations engaged in the MIW campaign. A dedicated maritime-support vessel is integral to completing this primary objective, and it also provides vessel support that can likely be purchased, operated, and maintained by the AFP into the future.

Vessel Acquisition Strategies

In order to adapt to ever-changing warfare environments, the US military has utilized a variety of different acquisition strategies—other than the normal PPBE (Planning, Programming, Budgeting, and Execution) process—for acquiring vessels to support various operations. Acquisition options now include leasing, chartering, and purchasing. Leasing or chartering, however, are not the preferred methods of acquisition by the US government, which follows a federal budgeting rule of fully funding most assets, systems, and platforms, including ships (Daggett & O'Rourke, 2005). To successfully adapt and respond to a changing environment, the military should have all acquisition options available; with all options available, the military

will also be able to quickly acquire the needed assets or systems. Unfortunately, this is not the case when leasing is proposed.

Vessel Requirements and Capabilities

As national security objectives continue to be addressed abroad, one of the biggest challenges facing the Department of Defense (DoD) is the dilemma of obtaining and maintaining forward bases. SOF is at the forefront of these objectives, and the need to maintain operational flexibility to counter political anti-access and irregular warfare challenges require some sort of AFSB to provide flexible and sustainable locations from which to operate. While it is true that any of the US's combative vessels offers overwhelming firepower dominance over most of her adversaries', political sensitivity does not allow for their presence (Corpening, Hurry & Young, 2006).

To further aid in the analysis of vessel capabilities, the OA4604 Wargaming Applications course within the Operations Research curriculum of the Graduate School of Operations and Information Sciences (GSOIS) at the Naval Postgraduate School assisted us in constructing a wargame scenario. We selected three candidate ships to be used in the scenario in the Philippine Islands. The intent of the wargame and analysis was to compare and contrast the capabilities of the three candidate ships as well as their ability to successfully complete anticipated missions in the Philippines. The candidate ships were the Edison Chouest *C-Champion* (current MSV); the High-speed Vessel (HSV) *Joint Venture*, which conducted operations in the Philippine Islands in the early part of the decade; and the Littoral Combat Ship *USS FREEDOM* (LCS-1), which will potentially be operating in the littorals of Southeast Asia. Figure 3 identifies the three ships and their general capabilities, as utilized in the wargame.

	MV *C-CHAMPION*	HSV-2 *SWIFT*	LCS-1 *USS FREEDOM*
			
Speed:	12 knots	35 knots	45 knots
Length:	220 feet	331 feet, 4 inches	379 feet
Beam:	56 feet	87 feet, 5 inches	43 feet
Draft:	16.5 feet	11 feet	12.8 feet
Displacement:	2,106 tons	1,463.6 tons	3,089 tons
Civilian Crew:	14 contract mariners	17 contract mariners	0 contract mariners
Military Crew:	None	Mil crew as needed	40
Weapons:	2 x .50 cal	1 x 25mm, 2 x .50 cal, 2 x MK-19	1 x 57mm, 4 x .50 cal, RAM
Endurance:	13 days / 10kts	1 day / 35kts	1 day / 45kts
	26 days / 5kts	6 days / 20kts	7 days / 20kts
Helicopters:	No Air Assets	Helo Pad	2 x MH-60Rs
Small Boat Capacity:	4 x 11m RHIBs	2 x 11m RHIBs	2 x 11m RHIBs
Owned / Chartered:	Chartered	Chartered	Owned

Figure 3. Wargame Scenario Ships
(MSC, 2010b; PEO Ships, 2009)

Cost versus Capabilities Trade-offs

Based on a set of capabilities for each vessel type under analysis, we calculated the cost per day of putting those capabilities on station at any given time. Evaluating each vessel on a cost-per-day basis provides decision-makers with a concrete assessment of the costs of deploying a specific capability for a given mission and further simplifies determining what those costs are over the anticipated duration of a mission.

For each vessel, we collected data on the capital costs (such as acquisition and procurement) or lease costs as well as on the operating and support costs. The cost data we collected for the Littoral Combat Ship (LCS) was taken from reports by the Congressional Research Service (CRS) and the Government Accountability Office (GAO) and is based on US Navy cost estimates. We collected costs for the Maritime Support Vessel (MSV) *C-Champion* from actual budget-and-spending documents at NAVSPECWARCOM. We obtained costs for the High Speed Vessel

(HSV) through conversations and correspondence with the Military Sealift Command (MSC); these costs are based on actual costs in a previous lease contract for the HSV-2 *Swift*. Table 1 summarizes the cost analysis of the LCS-1, the HSV-2 *Swift* and the *C-Champion*. By calculating the cost per day to bring a particular vessel and its capabilities into an MIW environment, decision-makers are able to make informed choices about how to deploy different assets in different scenarios. The LCS-1 brings considerable intelligence, surveillance, and reconnaissance (ISR), maneuverability, and firepower to any operation relative to the HSV or *C-Champion*. However, it costs approximately $222,000 per day to do so. The HSV offers maneuverability and considerable capacity at a rate of approximately $124,000 per day. The *C-Champion* offers utility and economy at approximately $28,000 per day.

Table 1. Summary of Vessel Costs per Day

	LCS-1	HSV-2 *Swift*	*C-Champion*
Unit cost	$480,000,000		
Baseline Lease Cost		$18,250,000	$7,569,000
Operating and Support Costs	$61,700,000	$26,845,000	$2,588,000
Cost per day	$221,644	$123,548	$27,827.40

Recommendations

Maritime irregular warfare is multidimensional, although there are identifiable activities associated with its conduct (see Figure 1). Accordingly, there is no universal vessel appropriate for all MIW environments either from a capability or cost perspective. To illustrate this point, consider four hypothetical scenarios—similar to real-world areas of operation—with varying degrees of demand for each of the mission sets. These scenarios are intended for use as instruments for discussing vessel applicability within certain contexts that may share characteristics of a specific geographic region or area of operation. Discussing each vessel in the context of a scenario demonstrates the types of cost and capability trade-offs that must be made when deciding what types of assets and resources should be deployed, assuming a mission duration and timeline, to achieve a desired result.

MIW Scenarios

In developing the hypothetical scenarios, MIW activity areas were weighted based on the team members' professional experience and on knowledge gained through the research process for this project. Figure 4 illustrates the distribution of the weighted percentages among the scenarios.

Maritime Irregular Warfare Activities	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Security Force Operations & Assistance	10%	20%	10%	20%
Civil-Military Assistance	10%		20%	10%
Counter-terrorism/piracy/narcotics	30%	70%	10%	50%
Building Maritime Partner Capability & Capacity	40%		60%	
Intelligence, Surveillance & Reconnaissance	10%	10%		20%

Figure 4. MIW Scenarios

Scenario 1 emphasizes the building of maritime partner capability and capacity as well as counterterrorism with some degree of civil-military assistance, security force operations and assistance, and intelligence, surveillance, and reconnaissance (ISR). In this type of situation, a prolonged presence should be anticipated, and sustained support for forces would be required (not dissimilar from the distribution of activities in the Philippines as part of OEF–P). While sleek and swift vessels such as LCS-1 and HSV can offer rapid response to a host of isolated situations within the scenario, their fuel consumption alone makes them cost-prohibitive. Furthermore, any extended presence of a gray-hulled vessel is going to attract the attention of the local population. For extended support of SOF in the region, a vessel such as the MV *C-Champion* would be the preferred option for decision-makers.

In Scenario 2, the highest level of effort is placed upon counterterrorism, counterpiracy, and counternarcotics. From a MIW perspective, this would include maritime interdiction operations (MIO), which typically employ visit, board, search,

and seizure (VBSS) teams. In this type of scenario, a slow, minimally armed commercial vessel would probably be less than ideal, as it is basically a floating target for even primitively equipped aggressors. Cost would be less of a factor, as a combatant commander would want a vessel with combative capability. A littoral combat ship or frigate could perform this mission adequately, and given an assumed heated environment in which pirates, terrorists or narco-traffickers are operating with impunity, political sensitivity to a warship off the coast would probably be irrelevant, as is the case in the vicinity of the Horn of Africa.

Scenario 3 describes a context somewhat similar to that encountered in Scenario 1. However, in this scenario, the overarching emphasis is placed upon building maritime partner capability and capacity as well as conducting civil-military operations. An amphibious warfare ship is most likely optimal, as it provides ample room for cooperative military training, berthing, and medical facilities. These types of vessels have a minimal footprint onshore, and their relatively shallow draft allows them to pull into austere ports to perform a variety of community-relations projects.

In the final scenario, we consider a context in which the counternarcotics mission is the primary focus. A fast and agile vessel would be preferred in order to intercept the stereotypical drug-runner speedboats that are often portrayed in the media. However, a more cost-effective method for counternarcotics operations might be the employment of the PC-1 *Cyclone* Class. These patrol craft do not have as sophisticated of weapons systems as frigates or littoral combat ships, but they do have the speed and firepower to get the job done.

Special Operations Forces Utility

While there may be some vessels with greater capability that could accomplish a particular SOF mission, it is important to recognize that such a vessel may actually have a decreased level of *SOF utility*. Through discussions with members of the SOF community, we found that the greater the ship's capabilities, the less it is dedicated and fully available to SOF and, therefore, the lower the ship's

SOF utility. Figure 5 compares the SOF utility of a particular vessel to the vessel's overall capabilities, showing that the two are inversely proportional. This figure aligns the intensity of the political environment with the corresponding vessel that would be required, showing how political environment and ship capabilities are directly related.

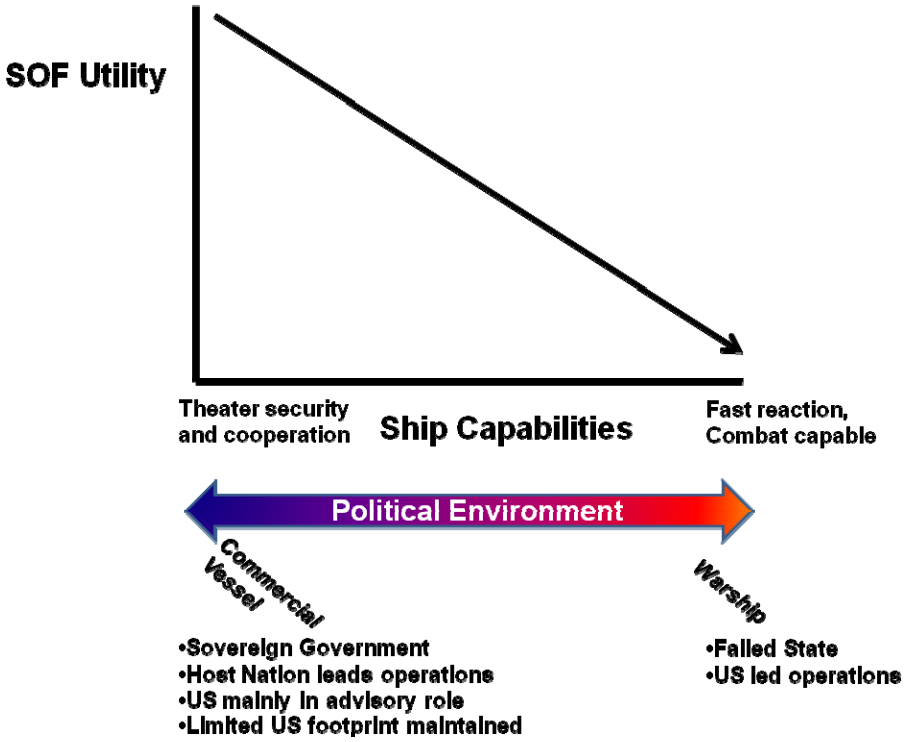

Figure 5. SOF Utility versus Ship Capabilities and Corresponding Political Environment

In a politically heated environment in which there is little to no governing authority, and cost is of little concern, a gray-hulled ship with a full complement of warfare capabilities would be required for quick response to a crisis or conflict and to take the lead in combat operations. While a combative may be able to provide support for SOF for a particular operation, its sustainability in a loitering role is questionable. Although required for heated conflict, a vessel with multiple warfare capabilities will eventually be assigned other tasks to exploit those capabilities, thereby limiting its role in SOF support. On the other end of the spectrum, in a calmer setting in which a sovereign government exists and SOF is in a long-term advisory role, a cost-effective solution offering dedicated support and sustainability is

required. In this type of scenario in which there is not a direct need for quick, lethal, and decisive force, a platform other than a gray-hulled warship may be desirable.

Conclusion

Global events constantly challenge the US military to respond to almost any scenario. Policy leaders, both military and civilian, must decide on the nation's objectives and strategies and then acquire the appropriate capabilities and platforms to meet those objectives and strategies. As the defense budget becomes more constrained, all viable options to pursue needed technologies or platforms should be considered. Our findings are consistent with those of Hughes et al. (2009) in their description of how the Navy can develop "a more distributed combat capability for sea control and the projection of national influence from the sea" through the acquisition of smaller, single-purpose vessels (Hughes, 2009). Because of the cost advantage of the MV *C-Champion*, two or three of these vessels could be deployed in an operational area at the same cost per day or less than an HSV or LCS, therefore ameliorating the disadvantage of being slowest to arrive at a scene of action.

Conventional nation-to-nation conflicts are not the norm in warfare. The US has used military force over 300 times since the American Revolution, and that includes only eleven declared wars and some sustained conventional conflicts. There have been roughly 30 major conflicts during the past decade, and only four actually occurred between nations (Jogerst, 2009). History shows that irregular warfare is a regular occurrence, and our Services are shifting to adapt to irregular challenges faced in this more common form of warfare. Gompert and Gordon (2008) found that the average length of an insurgency is more than a decade. If the US is to deploy maritime forces in support of counterinsurgency or irregular operations, then it is likely that assets deployed to support those forces will dwell for an extended period of time. Given the differentiated costs of the three vessels we studied as candidates to support MIW, it makes sense to send the vessel that provides the needed capability (as dictated by the tasks necessary to achieve a

mission within a given region or MIW scenario), with the highest SOF utility, at the lowest possible cost.

Although not the acquisition method typically preferred by the DoD, there are benefits to leasing/chartering vessels in support of MIW. The advantages that leasing/chartering could provide are lower upfront costs (if the cost of procurement is extended over the useful life of a vessel), greater response, and better value for taxpayers' money, especially for those assets and platforms that do not require an extensive acquisition process and can be purchased commercial off-the-shelf (COTS) or contracted through commercial companies. Leasing/chartering offers far more flexibility in highly dynamic operational environments since option years can be exercised at the discretion of the lessor. The flexibility of exercising future options allows the lessor to find the best vessel to meet current end-user requirements, whereas vessel procurement incurs a likely 30-year obligation to support, maintain, and utilize a vessel and limits the capacity to adapt to changing end-user requirements.

Under a different legislative context or regulatory climate, these options could once again be used. In the near future, the defense budget's anticipated growth in annual weapons investments may cause some politicians to become more open-minded to the leasing/chartering option if necessary systems cannot be acquired through traditional methods.

Based on the analysis and recommendations presented in this project, decision-makers will have a mechanism from which to make a more informed decision regarding the acquisition of vessels supporting MIW. The framework aligns specific vessels with their corresponding capabilities, on a cost-per-day basis. The cost-per-day comparison will aid commanders in determining the most appropriate vessel and the most cost-effective acquisition method.

.

I. Preface

The genesis of this MBA project was a series of conversations that we had exploring possible project topics with Dr. Dick Hoffman of the National Defense Research Institute (NDRI), a Federally Funded Research and Development Center (FFRDC) at The RAND Corporation, as well as with CAPT Jeff Kline, USN (Ret.), of the Naval Postgraduate School. We learned during these conversations that Dr. Hoffman and some of his RAND colleagues were beginning research on a project for US Special Operations Command (USSOCOM) and Naval Special Warfare Command (NAVSPECWARCOM) entitled Gauging Future Maritime Irregular Warfare: Insights from US Counterinsurgency Operations in the Sulu Archipelago. Their project's objective was to provide insights to help commanders gauge the personnel and equipment requirements of future maritime irregular warfare (MIW) operations by analyzing the impact of those operations in an environment—the Sulu Archipelago in the Philippines—that contains a significant maritime component.

Our team became interested in this topic because we were aware that the Navy, along with the other Services, was increasing its focus on irregular warfare (IW) operations, making this a current and relevant topic to pursue. Through more discussions with RAND researchers and members of NAVSPECWARCOM N85 Maritime Surface Programs, we also learned of the Maritime Support Vessel (MSV) program. USSOCOM and NAVSPECWARCOM were chartering a commercial vessel—the MV *C-Champion*, an Edison Chouest ocean-going tug—to serve as a quasi-Afloat Forward Staging Base (AFSB) for Naval Special Warfare (NSW) small- and medium-sized craft and their personnel to conduct training and operations with the Armed Forces of the Philippines (AFP).

As we learned more about the MSV program, we realized that further research and analysis would appropriately complement the RAND study by focusing on one specific aspect of MIW—maritime support vessels—and could also provide

valuable lessons for acquisition decision-makers in order to meet the needs of our military when conducting IW operations.

Thus began our journey..

II. Introduction

As the US military increasingly focuses more of its attention on irregular warfare (IW), each of the Services is struggling with how they can best leverage their resources and capabilities to address current and emerging asymmetric threats. Secretary of Defense Robert Gates has made it a priority to shift the Services' budgets from primarily spending on expensive platforms to fight big wars to spending on those capabilities that will enhance the US's capacity to fight small wars (Naylor, 2009). Secretary Gates addressed this refocusing of the budget in a speech given at the National Defense University in late 2008: "[w]e must not be so preoccupied with preparing for future conventional and strategic conflicts that we neglect to provide, both short-term and long-term, all the capabilities necessary to fight and win conflicts such as we are in today" (Gates, 2008).

Unfortunately, big and expensive platforms tend to be the commonly chosen solution for prosecuting contemporary and future conflicts. This fixation on a few large and costly platforms, or on units that are organized to wage big wars, has proven difficult to adapt to in order to effectively confront smaller asymmetric and irregular threats. Large bomber attacks and hundreds of thousands of troops did not beat the enemy into submission in Vietnam, and those same tactics haven't worked in Iraq or Afghanistan against insurgents. The military has not completely grasped that several small units working with indigenous forces and supported by fewer dedicated assets can have much more of an effect against a network or an insurgency than can the traditional bulky complement of forces the US applies to most threats (Arquilla, 2010).

From a maritime perspective, addressing MIW will require the concerted efforts of all of the maritime forces—the Navy, the Marine Corps, and the Coast Guard. This effort must include US Special Operations Command (USSOCOM) or, more specifically, its naval component, Naval Special Warfare (NSW), to be truly effective. While USSOCOM and NSW have been actively engaging in MIW since

their inception, the maritime Services have only recently begun to socialize and institutionalize the need to focus on IW through shifts in policy and spending.

While the maritime forces have only recently started to acknowledge the importance of MIW, they do have many inherent attributes that will considerably enhance their chances for success when dealing with threats of an irregular nature. The maritime forces have come together in an unprecedented unified strategy for addressing current and emerging threats in *A Cooperative Strategy for 21st Century Seapower*. In this comprehensive strategy, the maritime Services identify their most enduring qualities that provide their best chance for facing today's threats:

> The expeditionary character and versatility of maritime forces provide the US the asymmetric advantage of enlarging or contracting its military footprint in areas where access is denied or limited. Permanent or prolonged basing of our military forces overseas often has unintended economic, social or political repercussions. The sea is a vast maneuver space, where the presence of maritime forces can be adjusted as conditions dictate to enable flexible approaches to escalation, de-escalation and deterrence of conflicts. (US Navy, US Marine Corps, US Coast Guard, 2007)

The Navy has also begun to truly focus its own forces toward MIW by releasing two key documents that demonstrate its shifting focus toward engaging more irregular threats while still maintaining its "blue-water" superiority and doing this within an economic environment that will constantly put pressure on the way it procures for those purposes. *The US Navy's Vision for Confronting Irregular Challenges*, released in early 2010, speaks to the incorporation of IW in acquisition matters by enhancing the Navy's "ability to address, refine, validate, and incorporate urgent and emerging requirements to confront *irregular challenges* in the Planning, Programming, Budgeting, and Execution [PPBE] process" (CNO, 2010, p.7). This relates specifically to the various vessels necessary to carry out the Navy's ever-expanding spectrum of operations. However, acquiring the necessary equipment, technologies, and assets to meet operational requirements will become much more difficult, as expressed in the *Chief of Naval Operations (CNO) Guidance for 2010: Executing the Maritime Strategy* (2009):

> We are ready and capable today, yet we are stretched in our ability to meet additional operational demands. Our budget is pressurized and we are limited in our ability to invest everywhere we see a need. […] The balance between mandatory and discretionary spending at the national level, and high national debt over the next decade, will further increase the fiscal pressure on defense accounts. Growing demand for Navy forces and rising manpower, operating, and ownership costs challenge our ability to increase Fleet capacity while meeting operational demands and our commitment to our people. The year ahead will require discipline, strong resolve, and tough investment decisions. (p.1)

This constantly stressed budget requires the Navy and the other Services to think about acquisition in more untraditional ways than ever before.

As for SOCOM, its budget since 9/11 has increased significantly, along with its demand and responsibilities. While SOCOM has had many successes in acquiring assets for smaller, less costly programs and platforms, it has had modest to significant technical, programmatic, and funding issues with its more expensive programs (Francis, 2007). Most of these problems can be attributed to the lack of growth in its acquisition workforce during this timeframe and to poor acquisition information management, but the challenges also showcase the need for a more integrated acquisition relationship with other Services when trying to acquire major platforms through the PPBE process. That is not to say that SOCOM has not done an effective job addressing MIW through other acquisition methods in order to provide its forces the necessary platforms.

As the United States military continues to align the appropriate platforms for conducting MIW, SOCOM has leased/chartered civilian ships to provide the appropriate vessels needed to support operations in Operation Enduring Freedom–Philippines (OEF–P). Different vessels have been utilized for this mission to meet the shifting requirements of not only the combatant commanders but also of the Philippine Government.

The primary questions addressed in this study are as follows:

1. Are leased/chartered ships meeting the requirements to best support MIW?

What is the most appropriate mechanism for acquiring vessels to support MIW?

Using the experience gained in the Philippines during OEF–P as a baseline model, we will explore the capabilities of potential vessels relative to the requirements in potential MIW environments, and we will take a close look at the acquisition method most appropriate for obtaining vessels. Our study necessarily assumes a given set of mission scenarios and a specific operational geography, mission duration, and operating tempo.

The purpose of this project is to (1) identify the operational and technical requirements of US forces utilizing the vessels in support of MIW, taking into consideration the current capabilities offered; and (2) conduct research and analysis to examine those acquisition methods most appropriate for acquiring, supporting, and maintaining vessels in support of MIW. In the conclusion of our study, we will recommend the most effective vessels, in terms of cost and performance, to accomplish specific MIW missions and will identify the most effective acquisition method to meet those needs. Although we will focus on the Philippines as a baseline case, we will ultimately lay out three potential vessels for MIW and state how they would or would not be effective in a range of scenarios—one of which we have exercised through a wargame and for which we have observable data due to ongoing operations.

III. Research Objectives and Methodology

This study relies on a combination of site visits; interviews with subject-matter experts; turn-based, scenario-driven wargaming simulation; and cost analysis. The project team partnered with the sponsor, SOCOM/NAVSPECWARCOM N85 Maritime Surface Programs, as well as with the National Defense Research Institute (NDRI), a Federally Funded Research and Development Center (FFRDC) at The RAND Corporation, to evaluate capabilities and requirements of several candidate vessels for use in maritime irregular warfare and to develop recommendations for future vessel acquisition methods in order to help inform current and future MIW operations. We have examined various data resources (such as the current MSV program management and contracting strategy), requirements and capabilities for various vessels in support of MIW, and cost and performance data for those vessels (see Figure 6).

METHODOLOGY	RESEARCH OBJECTIVES
Interviews	• Identify the operational and technical requirements of US forces utilizing MSVs • Identify the acquisition process for acquiring vessels in support of MIW
Site Visits	• Tour the MV *C-Commando (*similar-type vessel as MV *C-Champion),* to gain insight from the crew on the vessel's strengths and weaknesses and its overall ability to accomplish stated missions and requirements
Literature Analysis	• Identify the capabilities of recently utilized and possible alternative MSVs in support of MIW
Acquisition Data Analysis	• Determine the risks (i.e., cost, schedule, performance, etc.) associated with different types of acquisition methods • Determine the impact that leasing MSVs has on operational lifecycles, length of service, and operational tempos of crews • Determine which type of acquisition method is most appropriate for acquiring, supporting, and maintaining MSVs in support of MIW
Wargame	• Evaluate the capabilities of three candidate vessels for maritime irregular warfare in a turn-based, scenario-driven wargame simulation

Figure 6. Methods Used to Meet Research Objectives

The remainder of this thesis is organized as follows: Chapter 4 begins with an overview of MIW as well as a background on OEF–P and the operational characteristics that drove the requirement for the current MSV. Chapter 5 briefly delves into specific acquisition issues necessary to meet the MIW requirement and then explores basic concerns regarding acquisition decision-making. In Chapter 6, we look at vessel capabilities, with an emphasis on MIW requirements for specified vessels. Many of the themes and concepts in Chapter 6 come from the literature on

MIW as well as from interviews conducted with the Special Operations communities at SOCOM, SOCPAC, and NAVSPECWARCOM.

To further aid us in this analysis, we received assistance from Colonel Jeff Appleget (US Army, Ret.) and his OA4604 wargaming applications course within the Operations Research curriculum at the Graduate School of Operations and Information Sciences (GSOIS) at the Naval Postgraduate School. We conducted a wargame scenario to provide analysis that compared and contrasted the capabilities of three candidate ships—the Edison Chouest MV *C–Champion*, the High-Speed Vessel (HSV), and the Littoral Combat Ship (LCS-1)—and their ability to complete anticipated missions in the Philippines.

Chapter 7 narrows down cost-versus-capability trade-offs and supports our recommendations and conclusions. By combining all of the arguments for the various vessels with the data we obtained, we are able to identify those that best support user requirements within a finite number of MIW scenarios and to locate key factors and trade-offs associated with different acquisition strategies and processes. We hope that the findings of this project will assist the US military in shaping the way vessels are acquired for the end-users actively engaged in maritime irregular warfare.

THIS PAGE INTENTIONALLY LEFT BLANK

IV. Literature Review and Background

This chapter discusses previously published works that provide background information on a number of subject areas. This background information offers a context for the topics discussed throughout the remainder of this MBA project. First, the chapter provides an overview of MIW. Next, it describes a successful contemporary example of MIW (specifically OEF–P) and shows how the requirement for an MSV evolved in support of this operation.

A. Literature Addressing Maritime Irregular Warfare

To begin this discussion, we must first look at the doctrinal definitions of irregular warfare. Irregular warfare (IW) is defined in the *DoD 3000.07* as "a violent struggle among state and non-state actors for legitimacy and influence over the relevant population(s)" (USD(AT&L), 2008). It goes on to say, "Irregular warfare favors indirect and asymmetric approaches, though it may employ the full range of military and other capacities in order to erode an adversary's power, influence, and will" (USD(AT&L), 2008). The Navy Irregular Warfare Office wrote, "IW emphasizes the use of indirect, non-conventional methods and means to subvert, attrite, and exhaust an adversary, or render irrelevant, rather than defeat him through direct military confrontation" (Mullins, 2009). MIW is not defined in naval or joint-military doctrine, but, in simple terms, it is the maritime component of IW, or IW conducted from or on a body of water.

As defined by the Navy IW Office, the following are operations and activities that comprise IW:

- Counterinsurgency (COIN);
- Unconventional warfare (UW),
- Counterterrorism (CT);
- Foreign internal defense (FID);

- Stabilization, security, transition, and reconstruction operations (SSTRO);
- Strategic communications;
- Psychological operations (PSYOP);
- Information operations (IO);
- Civil-military operations (CMO);
- Intelligence and counterintelligence activities;
- Transnational criminal activities (narco-trafficking, illicit arms dealing, and illegal financial transactions) that support or sustain IW; and
- Law enforcement activities focused on countering irregular adversaries. (Mullins, 2009)

Because these are land-based definitions of IW, it is important to examine the listed operations as they relate to MIW. Figure 7 identifies five fundamental IW operations as they relate to the maritime environment and domain.

Maritime Irregular Warfare Activities
Security Force Operations & Assistance
Civil-Military Assistance
Counter-terrorism/piracy/narcotics
Building Maritime Partner Capability & Capacity
Intelligence, Surveillance & Reconnaissance

Figure 7. Maritime Irregular Warfare Activities

Security force activities and assistance refers to exercises and work with foreign navies, coast guards, and maritime police forces, so as to improve their abilities to conduct maritime security operations, as well as operations to guard infrastructure, facilities, and supply lines that are of strategic interest to the United States (O'Rourke, 2009). Civil-military assistance refers to the use of Navy hospital ships, expeditionary medical teams, fleet surgical teams, and naval construction

units to provide medical and construction services, as well as to humanitarian and disaster response and relief in foreign countries as a complement to other U.S. diplomatic and development activities in those countries (O'Rourke, 2009). Counterterrorism, counterpiracy and counternarcotics activities include the interdiction, destruction, and discouragement through presence of illegal trafficking, piracy, or terroristic acts in the maritime environment. The building of maritime partner capability and capacity refers to the investment of time and resources in developing partner nation navies to function effectively in order to deny sanctuaries to pirates, illegal traffickers, violent extremists, and other nefarious parties (O'Rourke, 2009). Intelligence, surveillance and reconnaissance (ISR) activities refer to those actions undertaken to gain an understanding, as well as specific situational dispositions of active or potential threats to US or partner nation interests through the use of human and electronic means.

Although MIW is not currently defined by the Navy or in joint doctrine, it has been in existence in some form for a very long time, likely since the dawn of sea power. When combat took place on the water, a component of unconventional or irregular warfare in some shape or fashion inevitably developed to complement traditional maritime strategies. MIW has possessed and will continue to possess the potential—with only a minor investment in both personnel and equipment—to shift the overall balance of naval warfare (Sutton, 2000).

Generally speaking, the types of MIW missions conducted over the last 50 years in oceans, seas, and inland waters have remained relatively consistent (with the exception of technological advances), with naval guerrillas relying mainly on individual combat swimmers, high-speed boats, or unconventional submarine platforms for subsurface attacks on shipping vessels and for infiltrating forces ashore (Sutton, 2000). Today's naval special-operations forces conduct similar missions involving amphibious raids, unconventional warfare, and clandestine reconnaissance operations in littoral battlefields just as their predecessors did almost 50 years ago in Vietnam (Sutton, 2000). During Operation Market Time (1965–1973), the US Navy

performed interdiction missions with Swift boats, Navy patrol gunboats, and US Coast Guard cutters to stop troops and supplies flowing from North Vietnam to South Vietnam by sea. Swift boats were also used on the rivers of the Mekong Delta to disrupt North Vietnamese and Vietcong supply traffic during Operation Game Warden, initiated in December 1965. Operation SEALORDS, conducted from 1968 to 1971, implemented MIW missions to secure transportation routes, reduce infiltration routes, and establish a patrolled waterway interdiction barrier from Tay Ninh to the Gulf of Siam, utilizing conventional and special-operations forces.

Figure 8 identifies operations, tactics, and activities comprising MIW from the friendly, or US, side and the enemy's side. These operations and tactics have been long utilized by both the US and its adversaries and are likely to continue to be used in the foreseeable future. Since there is not a ready definition of MIW, the activities listed below quickly identify activities that should be included in a broad definition of MIW, and they establish a framework of MIW for our continuing research on vessels utilized to support MIW.

Friendly Operations, Tactics, & Activities Comprising MIW	Enemy Operations, Tactics, & Activities Comprising MIW
Show of Force: providing conspicuous naval forces to deter aggression	Hit-and-run attacks by small boats
Maritime Interdiction Ops (MIO) & Visit, Board, Search, and Seizure Ops (VBSS)	Maritime suicide attacks using light fiberglass boats
Maritime mobility in support of Special Operations and agencies	Frogmen to sink opponents' vessels
Sea-based forces afloat in support of operations ashore	Smuggling of equipment/drugs on various vessels
Maritime raids; hit-and-run attacks by small boats; frogman ship attacks	Piracy and hijacking of vessels
Intelligence, Surveillance, and Reconnaissance (ISR) of areas of interest ashore	Intelligence, Surveillance, and Reconnaissance
Training, advising, and assisting partner nations' maritime forces (proxies)	Invasion of territory via maritime routes
Civil affairs and construction activities to develop maritime infrastructure	Financial payments or civil support to local populace
Humanitarian assistance and disaster relief from a sea base or at sea	Humanitarian assistance at sea

Figure 8. **Friendly and Enemy Components of Operations, Tactics & Activities Comprising Maritime Irregular Warfare**
(DeLuca & Hoffman, 2010)

B. A Contemporary Case of MIW: Operation Enduring Freedom–Philippines

The case of OEF–P is a contemporary example of MIW. Since 2001, the United States has deployed Special Operations Forces (SOF) to the Philippines in support of OEF–P for counterinsurgency and irregular-warfare operations. A majority of the irregular operations occur in the Sulu Archipelago, and these operations require a significant maritime component in order to constantly adapt to the evolving environment. As with most IW operations, the mission has evolved over time, and the requirements are continuously changing or being refined in order to adapt to the enemy, the current mission set, and advancements in proficiency of the host nation's forces.

Slightly larger than the state of Arizona, the Philippines totals approximately 300,000 square kilometers and is encased by 36,289 kilometers of coast line. The territory contains over 7,000 islands, with over 3,200 kilometers of open waterways connecting the islands ("Philippines," 2009). The numerous islands and connected waterways pose an obvious challenge because they enable terrorist forces to move quickly from one island to another and make it difficult for opposing military forces to contain them. Due to the location and geography of the Philippines, US Naval forces perform both IW and MIW tasks and mission sets to successfully support their host-nation counterparts in defeating terrorist forces while accomplishing their foreign internal defense mission. The very nature of the geography in the Philippines requires a dedicated vessel to support maritime operations.

1. Background

The United States and the Republic of the Philippines (RP) have maintained close relations for over 100 years, starting during the US colonial period from 1898 to 1946. The US officially closed Subic Naval Base and Clark Air Base in the Philippines in 1992. However, cooperation in counterterrorism efforts has brought the two countries even closer together in recent years, especially since the attacks against the US on September 11, 2001, and the initiation of the Global War on

Terrorism (GWOT). In May 2003, the Bush Administration declared increased military assistance in the Philippines and designated the RP as a major non-NATO ally. The basis for this bilateral relationship is the security alliance between the US and the RP, counterterrorism cooperation, trade and investment ties, and shared democratic values (Lum & Niksch, 2009). One reason the bilateral relationship is important is because approximately 3 million Filipino-Americans live in the US, which makes them the second largest Asian-American group in the United States. Filipinos also constitute the largest number of immigrants serving in the US military, and an estimated 250,000 Americans live in the RP (Lum & Niksch, 2009). This relationship is also important because it has allowed the US to establish a semi-permanent base south of Luzon for the first time since World War II; it has carried the additional benefit of placing the US in a position to combat Islamic terrorism in the region, as well as to contain nearby China if necessary in the future (Kaplan, 2005). Admiral Keating, former commander of the US Pacific Command, stated that it is likely that the US will need to continue its efforts in combating terrorism in the Philippines for the foreseeable future:

> With US Government assistance, the Government of the Philippines reduced transnational terrorist organizations' capability, mobility, resources, and popular support to conduct attacks against US and Philippine interests. Although these transnational terrorist threats are substantially diminished, they have not been eliminated, and the underlying conditions for a stable and secure southern Philippines have not been fully achieved. Success will require a persistent interagency approach. (Keating, 2009)

2. OEF–P Strategy and Mission

OEF–P is a joint operation conducted by Special Operations Command Pacific (SOCPAC) that has been active in various forms in the southern Philippines since March 2001. The US also had members of the Army's 1st Special Forces Group (Airborne) (1st SFG(A)) actively involved in the RP prior to the events of 9/11. From March to July 2001, elements of the 1st Battalion, 1st SFG (A), conducted an advisory and assistance mission with the Armed Forces of the Philippines (AFP) by helping the AFP develop plans to target terrorist organizations.

By the end of 2000, the Abu Sayyaf Group (ASG) had kidnapped more than 50 western hostages and obtained more than $20 million in ransom for their release. This advisory and assistance mission became significantly more important on May 21, 2001, when the ASG kidnapped more than a dozen important Filipinos and three US citizens, including a missionary couple from a resort on the Island of Palawan (Farris, 2009). The hostages were transported to the ASG's jungle sanctuary on the island of Basilan and held for ransom. This event, occurring in the aftermath of 9/11, led SOCPAC, US Pacific Command (USPACOM), the State Department, and the Bush Administration to expand the GWOT by establishing OEF–P in order to more aggressively target the ASG.

USPACOM obtained permission to establish Camp Luzon and to train an AFP Light Reaction Company (LRC) as a national counterterrorist group for the Philippines in the role of first response to an escalating terrorist threat. After the attack on Palawan Island in May 2001, President Bush pledged $150 million in counterterrorism assistance to the Philippines, including $100 million of military equipment and funds for the expansion of the LRC training camp into OEF–P (Palilonis, 2009). Under OEF–P, the Joint Special Operations Task Force–Philippines (JSOTF–P) operates hand-in-hand with the AFP to conduct civil/military and combat operations and to limit the power and scope of the Al Qaeda–linked ASG and other terrorist organizations operating in the area (Palilonis, 2009).

As of January 2009, the JSOTF–P mission statement declared that "JSOTF–P, in coordination with the US Country Team, conducts Foreign Internal Defense (FID) with the Republic of the Philippines Security Forces in order to defeat Jemaah Islamiyah (JI) and ASG High-Value Individuals and neutralize enemy safe havens" (Farris, 2009). As defined in *Joint Publication 1-02*, "the country team is the senior, in-country, US coordinating and supervising body, headed by the chief of the US diplomatic mission, and composed of the senior member of each represented US department or agency" (CJCS, 2007). This mission statement emphasizes working with the existing and well-established US country team "by, with, and through"

legitimate Filipino security forces to neutralize JI and ASG and to eliminate the conditions that allow them to continue operations against the Filipino people and government.

JSOTF–P has designed their operations along four simple lines:

- capacity building,
- targeted Civil-Military Operations (CMO),
- information gathering and sharing, and
- information/influence operations.

These actions are applied along one or more of these lines of operation, focused on gaining and maintaining the support of the civilian population while neutralizing terrorist leaders, networks, and sanctuaries. The AFP plans and executes all of these operations, with members of JSOTF–P providing direction, training, and informational support as needed (Farris, 2009). Because American participation in actual combat operations is prohibited by the Philippine constitution, it is critical to note that the US has a strictly advisory role in OEF–P.

3. OEF–P Organization

The JSOTF–P operating forces are comprised of 500–600 personnel from all four branches of Service, including Army SOF, Navy SEALs, Air Force special operators, and support personnel from all four US military Services (JSOTF–P PAO, 2009). The Army typically provides soldiers to augment the JSOTF–P staff, a reinforced Special Forces Company, a Civil Affairs (CA) Company, and a military information support team (MIST). The Navy typically provides personnel to augment both the JSOTF–P staff and a Naval Special Warfare Task Unit (NSWTU), consisting of a SEAL platoon, a supporting boat detachment, and an Explosive Ordnance Disposal (EOD) detachment. The Air Force also provides personnel to augment the JSOTF–P staff, liaison teams to coordinate with the Philippines Air Force (PAF), a weather detachment, and several fixed- and rotary-wing aircraft to

support operations. Lastly, JSOTF–P is supported by general-purpose forces (GPF)—usually from the Marine Corps—or an Army infantry unit to provide security for base camps and facilities as well as to reinforce or support operations when needed (Farris, 2009).

The JSOTF–P Headquarters is located in the western archipelago town of Zamboango on the island of Mindanao and is staffed with fewer than 70 personnel. The primary elements of JSOTF–P are the reinforced Special Forces Company, the NSWTU, and the CA Company. The core elements are augmented by conventional forces and by other supporting personnel, whenever and wherever necessary, and personnel are task-organized into cross-functional teams. These teams are organized into three subordinate headquarters of approximately 100–150 personnel each and are known as Task Force (TF) SULU, TF MINDANAO, and TF ARCHIPELAGO. Figure 9 depicts the typical area of operations for OEF–P.

Figure 9. Example JSOTF–P Area of Operations
(JSOTF–P PAO, 2009)

Due to the size and nature of this operation, JSOTF–P has relatively few organic assets to support their mission. The US has intentionally limited the number of aircraft and ISR assets to reduce the American footprint in compliance with the host nation's wishes and legal requirements. There are typically ten or fewer aircraft (Farris, 2009) and a relatively small number of tactical-level Unmanned Aerial Vehicles (UAVs), resulting in a limited set of intelligence, surveillance, and reconnaissance (ISR) platforms. Military fixed-wing air support consists of a handful of aircraft, some of which are provided by contract. These aircraft essentially provide logistical support and personnel transport, but lack offensive capability. Rotary-wing aircraft are also limited for JSOTF–P, consisting primarily of two types of Blackhawk helicopters and contracted helicopter support, which, again, are mainly designed for logisitical support and troop transport. Unmanned Aerial Vehicles (UAV) are equipped only with cameras and have limited endurance capability to support ongoing operations. Due to the jungle terrain, Unmanned Aerial Vehicles used in support of OEF–P are much more restricted in OEF–P than in operations in Iraq and Afghanistan; thick foliage reduces UAV visibility and typically allows only observation of roads, clearings, and waterways.

4. Terrorist Organizations

The Muslim terrorist and insurgency situation in the southern Philippines has become increasing complex since 2002, when JSOTF–P and the AFP conducted their successful operation against the ASG on the Basilan Island off the southwestern tip of the big island of Mindanao. Although other developments could worsen the overall situation in the southern Philippines and in the entire country as a whole, one of the most worrisome trends is the growing cooperation on Mindanao between ASG and several major Moro Islamic Front commands and elements of JI (Lum & Niksch, 2009).

The ASG is a small, violent, faction-ridden Muslim group that operates in western Mindanao and on the Sulu islands extending from Mindanao. It has a

record of killings and of taking hostages for ransom and has also had previous, sporadic links with Al Qaeda. The US focus on ASG is complicated by the broader insurgent problem in the southern Philippines, including the existence of two separatist movements—the Moro National Liberation Front (MNLF) and the Moro Islamic Front. These organizations represent Moro ethnic and religious groups, which form a majority of the population in several provinces on Mindanao Island (Lum & Niksch, 2009).

5. Operations

The members of JSOTF–P operate *by, with, and through* their Philippine Armed Forces counterparts in a strictly non-combat role to perform the following functions:

- Bring humanitarian assistance to conflict-affected areas through the following programs:
  - Medical and Dental Civic Action Programs,
  - Veterinary Civic Action Programs, and
  - Engineering Civil Action Programs.
- Share information with the AFP. The US shares intelligence data and other information to assist AFP in planning future operations.
- Build capacity through subject-matter expert exchange programs to share lessons learned on the following subjects:
  - Explosive Ordnance Disposal,
  - Tactical Combat Casualty Care,
  - Marksmanship and Small Unit Tactics,
  - Civil-Military Operations Planning,
  - Maritime Operations, and
  - Casualty Evacuation. (JSOTF–P PAO, 2009)

Because the ASG has been a critical focus of the military operations, JSOTF–P has reduced the ASG's size from approximately 2,000 fighters in 2001 to fewer than 300 as of early 2009. JSOTF–P's advisory role to the AFP has also reduced the number of terrorist attacks in the region. The defense reforms and partnering missions with the AFP have also been effective in building the AFP's logistics and

maintenance capacity. In 2001, AFP helicopters were only mission capable 15% of the time, whereas in 2007, the mission-capable percentage rose to 80% as a direct result of improvements in maintenance and logistics training (Brookes, 2007).

6. US Foreign Assistance

After 9/11, the Philippines received a ten-fold increase in US military assistance. Assistance jumped from $1.9 million in 2001 to $19 million in 2002. The primary goals of US assistance included the following: fighting terrorism using both military and non-military means; supporting the peace process in Muslim Mindanao; promoting health and eductation programs, specifically in conflict-ridden areas of Mindanao; increasing private-sector competiveness; and promoting good governance (Lum & Niksch, 2009). The consolidated *Appropriations Act* for FY 2008, Section 699E, provided approximately $30 million for foreign military financing for the Philippines (Lum & Niksch, 2009). The House and Senate passed Continuing Resolution (CR), H.R. 2638 (the *Consolidated Security, Disaster Assistance, and Continuing Appropriations Act of 2009*), in September 2008. This bill was signed into law as P.L. 110-329. The CR for FY 2009 continued most foreign-operations funding through March 6, 2009, at FY 2008 levels (Lum & Niksch, 2009).

7. Maritime Aspect of OEF–P

Since the majority of the insurgency takes place in the Sulu Archipelago region of the Philippines, these operations require a significant maritime component to constantly adapt to the evolving operational environment. Further, the Naval Marines and Philippine Naval Special Operations Unit (NAVSOU) SEALs of the AFP are the primary forces utilized to confront the ASG and JI in this area. As a result, three different types of martitime support vessels have been previously or are currently assigned to TF Archipelago to support the Naval Marines and SEALs in conducting their operations. One of the primary maritime missions is the establishment of the Coast Watch South (CWS). The basic aim of the CWS is to promote maritime domain awareness and systematically augment Manila's ability to

mitigate the occurrence of maritime threats in zones around the Sulu-Sulawesi-Sabah tri-border area. The broad objective is to establish a string of monitoring stations that have both surveillance and interdicition capabilities and to connect these platforms through a central command center managed by inter-agency personnel but headed by the AFP (DeLuca & Hoffman, 2010).

8. Vessel Characteristics

Specifically in OEF–P, maritime forces are used to support and sustain distributed US outposts that are seeking to secure the local population, and to conduct Civil-Military Operations. These operations include logisitcs and intelligence support as well as an Afloat Forward Staging Base (AFSB) or operating base. They also include providing maritime quick reaction-force deployment and support training of AFP soldiers and security forces. A vessel that supports maritime forces operating in this irregular environment needs to be able to act as a forward-staging base, provide maritime mobility, refuel and rearm small crafts such as the Naval Special Warfare (NSW) 11-meter Rigid-Hull Inflatable Boat (RHIB) and the MKV Special Operations Craft (SOC), and provide a platform for maritime-security and humanitarian-assistance planning and operations. The overarching task of US maritime forces has been to build capacity among the AFP's Naval Marines and SEALs through training, equipping, and operational support. With this task in mind, the US has utilized various maritime support vessels throughout OEF–P, relying on lease/charter agreements and vessels of opportunity to provide direct logistics and employment support to SOF operations engaged in the MIW campaign. A dedicated maritime support vessel is integral to completing this primary objective. Additionally, it is important to build the capacity of the host nation's forces, while providing vessel support that can likely be purchased, operated, and maintained by the AFP into the future.

THIS PAGE INTENTIONALLY LEFT BLANK

V. Vessel Acquisition Strategies

It is the nature of MIW for requirements to change quickly. In order to adapt to ever-changing warfare environments, the US military has utilized a variety of different acquisition strategies—other than through the normal PPBE (Planning, Programming, Budgeting, and Execution) process—for acquiring vessels to support various operations. Acquisition options now include leasing, chartering and purchasing. Leasing or chartering, however, is not the preferred method of acquisition by the US government, which follows a federal budgeting rule of fully funding most assets, systems, and platforms, including ships (Daggett & O'Rourke, 2005).

This chapter will begin with a short overview of the three main acquisition strategies that the US utilizes—procurement, purchasing, and leasing. For the purposes of this study, we will focus primarily on leased or chartered vessels—the preferred method utilized by SOCOM—and on how those leases or charters are facilitated by the Military Sealift Command (MSC). Following a short discussion of MSC and its relationships and responsibilities regarding leases and charters, we will then present a case study of the current MSV program.

A. Acquisition Methods

1. Procurement

Procurement is the most common acquisition method the US uses to acquire vessels. This method is primarily preferred because it avoids the use of incremental funding—dividing a vessel's cost into two or more annual portions or increments—for acquiring vessels. Incremental funding has the potential to result in an incomplete, unusable end-item if future annual appropriations are not approved. The policy of fully funding procurement programs is one that congress, the Government Accountability Office, and the DoD have reaffirmed many times since

the 1950s (Daggett & O'Rourke, 2005). This policy is meant to facilitate the responsibility of congressional oversight of procurement programs. This fully funded policy is now threatened by increased budgetary pressures, decreased purchasing power, and increased costs of weapons systems.

Every acquisition process begins with an end-user requirement. From that requirement or need, military and government officials determine the best course of action to acquire whichever platform or technology best meets that needed requirement. If no commercial asset is available or suitable for military use, then the government often funds research and development in hopes of procuring this need. After the military identifies a need, a contracting officer receives a consolidated list of requirements and then solicits bids from different contractors. For any acquisition option, the list of requirements that are sent out to potential contractors is an extremely important part of this process. This list must be as accurate as possible because accuracy allows for not only a better product but also a more accurate and dependable budget in relation to a particular program. Once this list is distributed and a contractor is selected, the parties agree upon a contract. Often contracts are separated into phases, starting with research and development and followed by production, delivery, and maintenance (Hensley, 2008).

2. Purchasing

When procurement methods are unable to meet the needs of the military, purchasing an existing, suitable vessel provides an avenue to quickly field the needed equipment or platform. Ownership of equipment or assets is transferred to the government upon payment. When dealing with vessels, the main issue usually entails the level of conversion that must take place in order to bring the commercial ship up to military specifications. Full, up-front purchasing is the most common method, but there are also lease-to-purchase options that allow for testing, fielding, and evaluating prior to actually buying the piece of equipment or asset.

Of the many governing directives concerning lease-purchase decisions, the *Federal Acquisition Regulation (FAR)* explains that "the purchase method is appropriate if the equipment will be used beyond the point in time when cumulative leasing costs exceed the purchase costs" and that "agencies should not rule out the purchase method of equipment acquisition in favor of leasing merely because of the possibility that future technological advances might make the selected equipment less desirable" (GSA et al., 2010, Subpart 7.4).

Acquisitions through purchasing are also procured by using the General Schedule Administration (GSA) contract, GSA Schedules, and other Simplified Acquisition Procedures. Within the context of *the Federal Acquisition Streamlining Act (FASA)* and the *Federal Acquisition Reform Act (FARA)*, an expanded definition of "commercial items" that are considered "commercial off-the-shelf" (COTS) and are eligible for procurement include any item that has evolved from commercial items, been modified to meet government requirements, or been listed in the GSA catalog with accepted market pricing. These items only have to be offered for sale to the general public in the commercial market.

The use of other transaction authority (OTA) also provides a method of purchasing research and development prototypes and technologies available in the market today to meet requirements of the future and has provided a means to rapidly procure combatant craft and boats for the US Navy and USSOCOM (G.A. Weaver, personal communication, January 26, 2010).

3. Leases

Leases have historically met with immense resistance by the federal government, as evidenced by the Air Force's recent attempt to lease Boeing refueling tankers (Tirpak, 2004). All government agencies and services are responsible for proper application of the relevant definitions, principles, and

guidelines when engaging in lease-versus-purchase decisions (San Miguel, Shank & Summers, 2005).

Leasing and purchasing have different effects on the overall Department of Defense and national budget. The Office of Management and Budget defines scorekeeping as "the process of estimating the budgetary effects of legislation […] on the limits set in the budget resolution or legislation. Scorekeeping uses several metrics to compare these legislative effects such as budget authority, receipts, outlays, the surplus deficit, and the public debt limit" (OMB, 2009).

a. Types of Leases

To better understand the concepts associated with lease-purchase decisions, *OMB Circular No. A-11* (specifically, Appendix B) provides useful definitions to differentiate between a lease-purchase, an operating lease, and a capital lease:

A **lease-purchase** is a type of lease in which ownership of the asset is transferred to the government at, or shortly after, the end of the lease term. Such a lease may or may not contain a bargain-price purchase option (OMB, 2009, p. 6, Appendix B).

A **capital lease** is any lease, other than a lease-purchase, that does not meet the criteria of an operating lease (OMB, 2009, p. 6, Appendix B).

An **operating lease** is a lease that meets the following criteria:

- Ownership of the asset remains with the lessor during the term of the lease and is never transferred to the government;
- The lease does not contain a bargain-price purchase option;
- The lease term does not exceed 75% of the estimated economic life of the asset;

- The present value of the minimum lease payments over the life of the lease does not exceed 90% of the fair market value of the asset at the beginning of the lease term;
- The asset is a general purpose asset rather than a special purpose asset of the government and is not built to the unique specifications of the government as lessee; and
- There is a private-sector market for the asset.

If these criteria are not met, then the lease is considered a capital lease or a lease-purchase, as appropriate. Multi-year service contracts (e.g., grounds maintenance) and multi-year purchase contracts for expendable commodities (e.g., aspirin) are considered operating leases. Agencies should consult with the OMB for cases in which a service contract requires a private contractor to construct or acquire a capital asset solely or primarily to provide the service to the government (OMB, 2009, p. 6, Appendix B).

b. Risk Associated with Leases

Risk refers to the level of private-sector risk. Lease-purchase agreements are scored as having or not having substantial private risk, depending on the level of private-sector risk. Substantial private risk indicates the absence of substantial government risk. Risk is defined within the context of the project. If the project is less governmental in nature, then the private-sector risk is considered to be higher.

The following types of illustrative criteria indicate ways in which a project is considered less governmental:

- There is no provision for government financing and no explicit government guarantee of third-party financing.
- Risks incident to ownership of the asset (e.g., financial responsibility for destruction or loss of the asset) remains with the lessor unless the government was at fault for such losses.

- The asset is a general-purpose asset rather than a special-purpose asset of the government and is not built to the unique specifications of the government as lessee.
- There is a private-sector market for the asset.
- The project is not constructed on government land.

c. Guidelines for Making the Lease or Purchase Decision

Three main measurements—utility value, investment costs, and period before obsolescence—have been used over the last few years to form the basis of discussions dealing with lease-purchase decisions. This system of measurement has been utilized by the government recently, although some officials say that it is not used enough or given enough weight. Each measurement element is detailed below with some associated questions to guide officials as they decide whether to buy or lease (Hensley, 2008).

Utility Value:

- How useful is the total system, including its equipment, facilities, and people?
- Does it have many other applications, or is its value limited to narrow parameters that require specific threats or operational applications and environments?
- What about the equipment needed to field it? Can any of it be used or modified to support other systems, thereby increasing its own utility value?
- What about the utility value of the people required for operation and maintenance? Are they and their training a part of this system's acquisition?

Investment Costs:

- Is the system expensive, in real terms, considering its total cost, including its people and their training?

- If a new building must be built to house the new system and its people, is the cost of that building also part of the system's cost?
- What about the investment in repair parts, their handling and repair, the storage equipment to stock them, and all the other related expenses involved in the system's acquisition, including new transportation vehicles and security requirements?

Period before Obsolescence:

- Is it likely that a smaller, simpler, and more portable system will come along at a lower cost to buy and operate? (Tompkins, 2008)

d. Leasing Background

As the US military adapts to changing operational environments, it must find new capabilities and platforms to address ever-changing requirements. To successfully adapt and respond to a changing environment, the military should have all acquisition options available in order to quickly acquire the needed assets or systems. Unfortunately, this is not the case when leasing is proposed. The military is constrained by a highly bureaucratic and often slow-moving acquisition system and by the politics of Washington, which, since the 1980s, have made the leasing of necessary platforms very unattractive to commercial companies (Hensley, 2008).

While this subject has not been extensively discussed elsewhere, San Miguel, Shank, and Summers (2005) take an analytical look at the history of one successful leasing program—Maritime Prepositioning Ships (MPSs)—in a paper that they wrote in response to the unsuccessful attempt by the Air Force to lease refueling tankers from Boeing in 2003. The Boeing case brought the issue of leasing back to the forefront of discussions about military acquisitions.

The authors of that study begin their analysis with a short synopsis of historical lease arrangements within the Navy. They also provided examples that date back to World War II when the Navy contracted over 450 supply ships with

merchant marine crews, back to the Korean conflict when the Navy contracted more than 200 ships, and back to the Vietnam War when T1 refueling tankers were used.

San Miguel et al. (2005) contend that the MPS program created such a backlash from Washington politicians that lawmakers passed subsequent laws to ensure that a recurrence of such a situation would be prevented. Representatives passed these laws in response to perceptions that the program circumvented the acquisition process and, consequently, denied the possibilities of job creation to their constituencies. It is also likely that this program denied elected officials the ever-important political capital they needed in order to maintain their constituencies' votes and support.

After San Miguel et al. (2005) explained the various stakeholders' points of view and financial reasoning, they presented their own analytical comparisons. Most of the analytical data and conclusions that San Miguel et al. proposed were based on the assumptions, tax benefits, interest rates, and residual values of the period in question. After discounting the political motives that each stakeholder used to skew the numbers in order to best support each side's desired outcome, they showed how the different viewpoints should have been computed based on the financial and accounting principles of the time. Many of the stakeholders in the MPS case adjusted interest rates and made different assumptions based on their political views. San Miguel et al. attempted to analyze the case dispassionately by using the basic assumptions required to determine the most realistic model for comparing leasing-versus-purchasing options for the MPSs.

San Miguel et al. concluded that, based on their interpretations, leasing was substantially more cost effective than purchasing by about $64.4 million per ship. The $64.4 million figure includes the reduced costs associated with adhering to commercial shipbuilding standards instead of military standards, as well as the costs associated with significantly decreasing the acquisition process period from 5–7 years to about 2 years.

From an SOF perspective, another extremely successful example was the Mobile Sea Bases that the US leased during "The Tanker War" (1987–1988) in the Persian Gulf to support Navy SEALs and the Special Operations Air Regiment (SOAR, the "Nightstalkers"). To respond to Iranian mine attacks on oil-tankers, the US needed to station US forces in the northern part of the Persian Gulf for prolonged periods of time; the occasional US warships transiting the area were not able to maintain a strong enough presence to effect any change in Iranian activities. When Saudi Arabia and Kuwait denied the establishment of land bases on their soil due to concerns over domestic issues that would ensue from having foreign forces present, the US decided to lease two oil field support barges to provide a "base" for SOF while maintaining a low profile so as to not provoke Iran. Each Mobile Sea Base was anchored in international waters in the northern Persian Gulf and had the combined ability to endure the harsh gulf conditions while having the mobility to move frequently in order to support operations in various locations and/or to maintain operational security. The lease for both barges was for $21,000 per day, which included provisions for supplying water and fuel and for housekeeping services provided by an embarked, civilian-contracted crew (Zatarain, 2008).

B. Military Sealift Command Overview

The Military Sealift Command's history can be traced back to World War II. At that time, four separate government agencies managed sea transportation for the military Services. Shortly after the war, these agencies were consolidated into the Military Sea Transportation Service (MSTS) to become the sole managing agency for the DoD's ocean transportation needs. MSTS was renamed Military Sealift Command during the Vietnam War.

The Military Sealift Command is responsible for providing sealift and ocean transportation for all military Services and other government agencies as well as for administering DoD auxiliary ship leases. Figure 10 depicts the MSC chain of

command. The MSC is organized around four mission areas, each of which is managed by one of the following program offices:

- Naval Fleet Auxiliary Force or NFAF (PM1),
- Special Mission (PM2),
- Prepositioning (PM3), or
- Sealift (PM4).

The Military Sealift Command reports through three distinct and separate chains of command:

- To the US Fleet Forces Command for Navy transport matters,
- To the US Transportation Command for defense transportation matters, and
- To the Assistant Secretary of the Navy for Research, Development, and Acquisition for procurement policy and oversight matters.

Figure 10. MSC Chain of Command
(MSC, 2010a)

Although the MSC has an annual operating budget of approximately $3 billion, it receives no direct funding appropriations to support command operations. The MSC finances its operations through the use of working capital funds. Working capital funds are accounts that are reimbursed by direct appropriations or by funds transferred into the account by the various MSC customers. The MSC draws funds from the working capital fund to pay for command operations. The goal of a working capital fund is to breakeven rather than make a profit the way a private company would operate.

The MSC utilizes two working capital funds:

- The Navy Working Capital Fund, which supports Navy fleet commanders and other Department of Defense entities, and

- The Transportation Working Capital Fund, which supports sealift services.

To comply with the *Competition in Contracting Act of 1984* (P.L. 98-369), the MSC is obligated to seek full and open competition in the procurement of ship charters. According to this act, the MSC requires solicitations of offers to specify the agency's needs in a way that promotes competition and requires that offers be evaluated solely on the factors specified in the solicitation. The act also states that the type of specification included in the solicitation depends on the needs of the agency and the market available to satisfy those needs. According to the GAO, the trade-off between military use and cost should be left to the procuring agency, which is best able to assess its true needs (Ferber, 1989).

The MSC charters ships under three types of contracts:

- Bareboat—a contract for the exclusive use of a ship for a defined period of time, with the MSC being responsible for the crewing, operating, supplying, and servicing of the ship. These types of charters are infrequent.
- Spot—a contract, at a fixed fee, for as little as a single voyage, with the owner operating the ship and paying all costs out of the fixed fee.
- Time—a contract for the use of a ship and its crew for a specified period of time, with the MSC paying the owner a fee to operate it and reimbursing the owner for fuel costs and port charges. (Ferber, 1989)

Time charters are the bulk of the MSC's business and are the focus of this study since it addresses the current MSV program. These charters consist of time periods ranging from six months to five years. Since FY85, however, the MSC has restricted time charters to 17 months, with provisions for up to two 17-month options to comply with a legislative limit of 18 months. Section 1011 of the Fiscal Year 2008 *National Defense Authorization Act* (P.L. 110-181) requires congressional notification, a lease-versus-purchase cost analysis, as well as plans to procure a vessel that meets DoD requirements when the analysis indicates that it is in the best

interest of the government for all charter-vessel contracts with performance periods to be in excess of two years.

Some important cost definitions to understand when dealing with chartered vessels include:

- Charter-hire per diem—the average daily cost of chartering a vessel. It includes the fixed-price cost of the vessel operation when under contract, such as maintenance and repair, spare parts, crew wages and benefits, provisions, supplies, etc. It also includes anticipated capital costs (loans, etc.) associated with a vessel.
- Operating per diem—the average daily cost of operating a government-owned vessel, exclusive of maintenance and repairs. Costs associated with shipbuilding are covered in another line.
- Daily M&R costs—the daily average of estimated maintenance and repair (M&R) costs of a government-owned vessel.

Meeting the DoD's transportation requirements at the lowest cost is the MSC's goal in awarding time charters. The most common acquisition is the lowest priced, technically acceptable method. In this procedure, the MSC requests proposals from as many ship owners or operators as it can identify and selects the lowest priced, technically qualified offer. In order to attract more bidders, the MSC attempts to accommodate offerors' concerns by not compromising customers' needs or other requirements. In one case, the MSC extended the delivery date and allowed for additional "reasonable-cause" delay on one Request for Proposal (RFP) in response to an offeror's complaint that the time originally allowed may not have been sufficient for ship modifications or construction that would have been needed to meet requirements (Ferber, 1989). As in the commercial world, more competition means lower costs.

There have been some stakeholders that have raised concerns in the past over how much influence the MSC has over the administration of these contracts. Because the MSC is a government-induced quasi-monopoly, some sponsors, like

the Navy or SOCOM, have believed that the MSC has had limited incentives to control costs. Due to its monopolistic nature, some sponsors—along with some in the commercial shipping industry—have believed that the MSC has had the potential to take advantage of its customers, which tends to make sponsors uneasy about the relationship. Since sponsors are forced to go through the MSC to operate their ships, they cannot compare costs across providers or rely on the market to keep the prices fair due to a lack of procedural and decision-making visibility on the part of the MSC (Whatley, 1996).

C. Early History of the Maritime Support Vessel (MSV)

Long before the JSOTF–P requirement for a dedicated MSV, a variety of ships were used to support MIW operations in the Philippines. After 9/11, SOCOM negotiated between the Army and the Navy for the last two years of a five-year split lease of the High Speed Vessel (HSV) X1 *Joint Venture* in order to evaluate its ability to perform specific mission scenarios and limited operational experiments and assess the vessel's usefulness in US military applications. Essentially a high-speed catamaran originally designed as a ferry, the HSV was modified for military purposes. SOCOM utilized the HSV in many areas of the world, including the Philippines, during this time and even used it as part of the invasion force for Operation Iraqi Freedom by speeding it into the shallow Persian Gulf. Use of the vessel was discontinued when its lease expired after two years. There were no other high-speed catamarans commercially available to replace the HSV when its lease expired. All other catamarans with suitable configurations or capabilities were either already under charter or not available in a timely manner (MSC, 2010b). Figure 11 identifies the HSV-X1 *Joint Venture*.

Figure 11. HSV-X1 *Joint Venture*
(MSC, 2010b)

Also in 2001, the Military Sealift Command commissioned the *USNS GySgt Fred W. Stockham* (T-AK 3017) as part of the Maritime Prepositioning Force. The *Stockham* was configured to strategically position supplies for the US Marine Corps at sea and was laden with a variety of equipment and supplies, including tanks, ammunition, food, hospital equipment, petroleum products, and spare parts—all ready for rapid delivery ashore when needed (MSC, 2010). As part of a five-year lease starting in 2003, the *Stockham* was also available for limited operations in the Philippines. Figure 12 identifies the *USNS Stockham.*

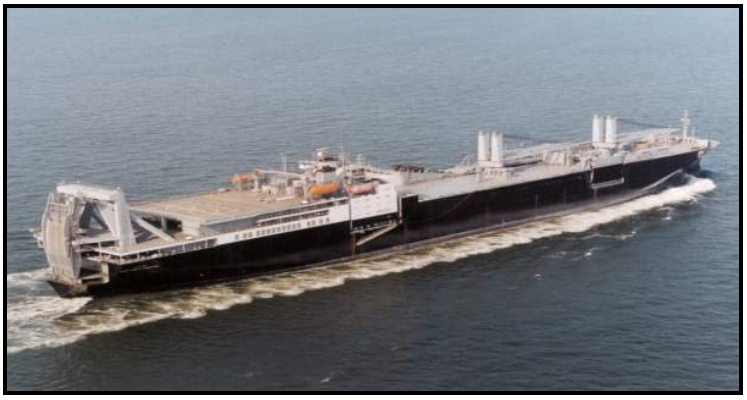

Figure 12. *USNS Fred W. Stockham* (T-AK 3017)
(MSC, 2010b)

Many other gray-hulled warships in the region were utilized as vessels of opportunity when these leased vessels were not available. Of the different ships available, none of them met all of the requirements on a consistent basis. The HSV's speed and radical design did not lend itself to the long days of loitering required for "be prepared for" missions. The *Stockham* had size and the ability to loiter but also had the possibility of being called away on a prepositioning mission at a moment's notice. The availability of these gray-hulled warships was even more tenuous due to other taskings.

By 2005, there was no obvious ship in the current DoD inventory that could meet SOCOM's requirements for supporting a dedicated maritime irregular warfare effort. Once the requirement for an MSV was established, the focus shifted to how to properly meet that requirement by using existing platforms in service, by procuring a vessel through the PPBE acquisition process, or by leasing or purchasing an appropriate vessel from a commercial source.

While the US military has a number of ships capable of performing the required mission, the political environment of the Philippines did not support US warships patrolling the coast on a regular basis (England, 2008). This political limitation hampered the use of commissioned ships to serve in this capacity, and it may have actually hindered the efforts of the US by discrediting the Philippine government and becoming a magnet for insurgent propaganda.

D. MSV Program Strategy

From its inception, the employment of the MSV was described as a ship to support, launch and recover, refuel and rearm, and provide limited maintenance to various-sized craft, both organic and non-organic. However, it was mainly envisioned by JSOTF-P to support the Naval Special Warfare (NSW) 11-meter Rigid Hull Inflatable Boat (RHIB) and the MKV Special Operations Craft (SOC).

Operated by a three-person crew, the 11-meter RHIB is designed for the insertion and extraction of SEAL team personnel. It is a twin-turbocharged diesel engine, waterjet-propelled personnel carrier with a fiber-reinforced plastic (FRP) hull and an inflatable sponson, capable of speeds of up to 48 knots.

The MKV SOC is a high-speed (50+ knots), medium-range SOF insertion and extraction craft with a shallow draft, 500+ nautical-mile range that can carry a fully equipped SEAL platoon (16 operators). It has a twin diesel engine powered by water jet drives. The MKV also has an enhanced communications suite and can be outfitted with eight 0.50 caliber machine guns and combinations of grenade launchers. Figure 13 identifies both the NSW 11-meter RHIB and the MKV SOC.

Figure 13. NSW 11M RHIB and MKV SOC
(US Navy, 2010)

Additionally, the MSV would need to provide berthing and habitability for the ship's crew and 30 additional personnel for at least 30 days without resupply. The vessel should also be capable of storing ordnance, specialized communications equipments, and approximately 8,000 gallons of motor gasoline (MOGAS) and have the ability to refuel small boats on deck and in the water.

Although the MSV's operating area was designated as the Southeast Asian littorals, there was a desire for this vessel to operate in a wide range of areas around the globe. The ship would be in full operating status throughout the charter period with extended at-sea deployments and should be able to enter austere ports and

provide its own services without external assistance. The vessel would also be required to have a minimum endurance of 30 days at sea to include on-station loitering to support personnel and boats. A minimum range of 10,000 nautical miles with at least 12-knots speed was also desired. The requirement for at least 12-knots speed demonstrates the importance of loitering for long periods rather than a need for traveling to different areas at high speeds.

The desired vessel to support MIW was described in many ways,[1] but from a requirements standpoint, it needed to fulfill four critical roles:

- Afloat Forward Staging Base (allowing personnel to live onboard),
- Maritime mobility (moving things and people around),
- Small-boat refueling (extending boat range), and
- Theater Security Cooperation Planning (helping other nations).

Fulfilling these critical functions in an MIW sense involved supporting the launch, recovery, and staging of AFP boats in order to enhance the ability to support the Philippine counterinsurgency campaign. NSW's primary mission of OEF–P was to promote and assist in capacity building of the AFP by operating alongside its Philippine counterparts—such as the Philippine Naval Special Operations Unit (NAVSOU), which included Philippine SEALs—through training and operations conducted onboard and on vessels previously operating in the area.[2]

---

[1] Some stakeholders characterized the MSV requirement in the following ways: as "a mother ship for NSW combatant craft"; as a ship "designed to transport personnel, equipment and supplies to remote locations that can't be reached with larger vessels"; as "a floating 7-11"; and as "a floating Motel 6." (NAVSPECWARCOM, 2009)

[2] In the early months of 2010, the Philippines' NAVSOU purchased four 11-meter RHIBs to help combat the illegal activities conducted in the vast waterways of the Philippines by maritime terrorist and other groups. As part of OEF–P, US Navy Special Warfare Combatant Crewman and SEALs conducted a six-week class to train their AFP counterparts on basic craft operation, maintenance, and navigation as well as on conducting tactical employment training from the RHIBs. This training was

E. MSV Program Execution

The acquisition process for the MSV consisted of three distinct, but overlapping, phases:

- Acquisition of Funding Phase (February 2006 to February 2007),
- Requirements Phase (December 2006 to May 2007), and
- Construction Phase (May 2007 to November 2007).

1. Acquisition of Funding Phase

In February 2006, SOCPAC issued a Statement of Requirement to SOCOM for "a SOF AFSB and mother craft for NSW combatant craft" (NAVSPECWARCOM, 2008). In May 2006, US Pacific Command (PACOM) sent a Request for Forces (RFF) to the Joint Staff for "a vessel with an innocuous appearance, similar to an ocean going tug" (NAVSPECWARCOM, 2008).

Naval Special Warfare Command N3/5 routed an Operations and Maintenance (O&M) and an Investment Unfunded Requirements (UFR) request in June for a vessel program in which total cost would equal approximately $9.5M per year (modifications not included). However, the Joint Staff and Joint Forces were unable to fund the request, and they recommended sending it to the Navy and SOCOM. PACOM immediately sent the request to SOCOM and the CNO "in order to maintain a discrete signature and access to ports" (NAVSPECWARCOM, 2008).

In January 2007, the Office of Naval Operations (OPNAV) approved $7 million (FY07 funds), and the OSD directed that $10 million per year be provided

---

conducted from the current MSV, the *C-Champion* utilized by NSW in support of OEF–P and JSOTF–P operations (JSOTF–P PAO, 2009).

from PACOM to the Joint Staff until 2012. After funding was secured, PACOM officially endorsed the SOCPAC MSV requirement on February 1, 2007.

2. Requirements Phase

The Requirements Phase began in December 2006 when the first list of requirements was agreed upon by the MSV Working Group; it consisted of SOCPAC and various Naval Special Warfare units. Once the initial requirements were established, the MSC Charter Requirements Questionnaire (1st draft) was completed and submitted to the MSC in January 2007, along with a spreadsheet delineating each unit's position regarding each requirement.

Once the MSC received the questionnaire, it then issued a market survey in January in order to gather information on which companies had vessels that could fulfill the requirements. Results from the survey showed that no ships would be available until July or August of that year. Based on the gathered information, the MSC called for a lowest priced, technically acceptable bidding instead of best value, which significantly shortened the bidding process to only five months compared to the average of 11 to 18 months. The MSC also completed a draft Statement of Work that was reviewed by NSWC N-85 and SOCPAC to ensure that both concurred with the wording of the document.

After posting an RFP on their website, the MSC began the technical review process of all written proposals, which were followed by oral presentations given by the bidding companies at the MSC in March. These oral presentations were an innovation that the MSC coordinated in order to facilitate shortening the period of time in which companies had to draft their proposals. Technical evaluations of all best and final offers (BAFOs) were conducted at the MSC in April. Seven different companies proposed a total of eight different ships, although only four ships were considered technically acceptable. The lowest bidder was selected. A pre-award survey of the Edison Chouest vessel *C-Courageous* was conducted by the end of

the month, with a charter award finally being presented to Edison Chouest Offshore (ECO) on May 10, 2007, for a period of time totaling four years and 11 months, allowing for an extra 30 days to renegotiate the contract before breaking the five-year limit.

The Navy has had extensive experience dealing with ECO and has used different types of lease arrangements to acquire the specialized support services of vessels owned and operated by ECO (Wiggins, 1999). The Chouest vessels have generally been leased on a short-term basis—less than five years—for transportation services, fleet tug services, and special missions, such as oceanographic surveillance and research. Under these leases, the Navy pays for the services of the vessel, its crew, and its operations and maintenance (O&M) on a daily-use basis. Since 1969, the DoD has required its components to perform economic analyses of lease-versus-purchase decisions. Lease-versus-purchase analyses are not required for short-term lease arrangements (Wiggins, 1999).

3. Construction Phase

Within days of signing the contract, ECO had to swap vessels due to the extension of a prior contract for *C-Courageous*. The new ship, *C-Champion*, was of similar design as *C-Courageous* and was determined to not adversely affect the contracted requirements. The 220-foot long, 56-foot wide vessel boasted a 16-foot beam and a working deck of about 3,640 square feet. *C-Champion* had previously been in international service for PEMEX, the Mexican national oil company, and, therefore, had already been upgraded to meet more stringent standards set by the International Convention for Safety of Life at Sea (SOLAS).

C-Champion was be modified for use at ECO's North American Shipbuilding (NAS) facility in Larose, Louisiana, which designs and constructs vessels only for ECO and its affiliated companies. NSWC N85 Maritime Surface Programs

coordinated extensively with ECO NSA throughout the construction phase to ensure the modifications were in accordance with contracted requirements and standards.

C-Champion was expected to be in the shipyard by the beginning of June in order to begin operations and habitability modification fabrication but was delayed and did not arrive until the end of the month. Some of the bigger modifications included a water maker, an alarm system, a crane system, and a berthing compartment to house the 30 service members required for operational purposes. A 7-meter Rigid Hull Inflatable Boat (RHIB) was also purchased to facilitate the administrative transits from the vessel to shore that were anticipated once the ship was in the area of operations.

While the ship was being modified for service, *C-Champion*'s crew—12 civilian mariners—began the necessary training in preparation for the mission they would begin once in the area of operations. This training included weapons proficiency, force-protection drills, and small-craft launch and recovery. Before the American Bureau of Shipping (ABS)/Coast Guard inspection in late August, issues with the ship's crane became apparent. The ship's crane was not rated for personnel, as was required by the contract, and, therefore, did not meet mission requirements. Once the crane was determined to be not man-rated, an alternative system was tested in which empty 11-meter RHIBs were moved to a man-rated davit via an extremely large single-point shackle. This procedure induced considerable instability when the craft was lifted to the required height to clear fixed deck equipment and also involved various awkward movements and momentary disconnections, resulting in much longer launch times. It was determined by the MSC that the proper requirements should have called for a "launch device" rather than specifically requiring a crane, which would have allowed for other launching mechanisms to be considered. The MSC admitted that it should have involved its technical experts, such as MSC engineers, to evaluate the technical requirements to launch and recover boats. This may have prevented the improper ordering of the

crane. It was later decided by the end-users that a system of four davits would accomplish this critical mission requirement. Once the davit system was assembled, launch-and-recovery testing resumed with final construction, testing, and delivery completed in early December.

As with any program, there were many coordination and expectation management issues associated, as well as satisfying all issues of each of the concerned parties with a vested interest in the contract. However, considering that the decision-making process involved stakeholders from five different organizations working in five different time zones—Contract Officer at the MSC in Washington, DC; Construction at the shipyard in Louisiana; Requirement consolidation by NSW in San Diego; Requirement and spending approval by SOCPAC in Hawaii; and the ultimate end-user at NSWU-1 in Guam—the final product was well received by all.[3] Figure 14 is a photograph of the MV *C-Champion* operating in the vicinity of the Philippines.

[3] One SOCPAC staff member's observations concisely described how most felt upon initially viewing the vessel: "blown away by how great the MSV package looks […] so clean and orderly you could eat off the deck. The facilities, crew accommodations, communications suite, etc. were all first class. […] It's up to them now to fully utilize the platform." (NAVSPECWARCOM, 2009)

Figure 14. MV *C-Champion*
(NAVSPECWARCOM, 2009)

F. MSV Budget and Finance

The modifications to *C-Champion* totaled approximately $7 million. The MSV's budget for FY08-10 is just over $10 million per year. To facilitate increased management of the funds and to deal with other administrative and miscellaneous issues such as mid-year UFRs, NAVSPECWARCOM automatically taxes this amount 5%. Fuel, food, berthing, port costs, travel, and various miscellaneous costs incurred throughout the year are subtracted from the remaining amount (approximately $9.099 million). In accordance with the charter contract, the daily rate for the ship and crew is approximately $18,000.

The MSC also taxes the amount remaining following the NAVSPECWARCOM taxes for the year, although this percentage has decreased over the years from 7% in FY08 to 4% in FY10. This tax applies to the daily rate, fuel, food, and other miscellaneous expenses paid through the MSC. Figure 15 depicts the requirements generation and the financial process for the MSV program.

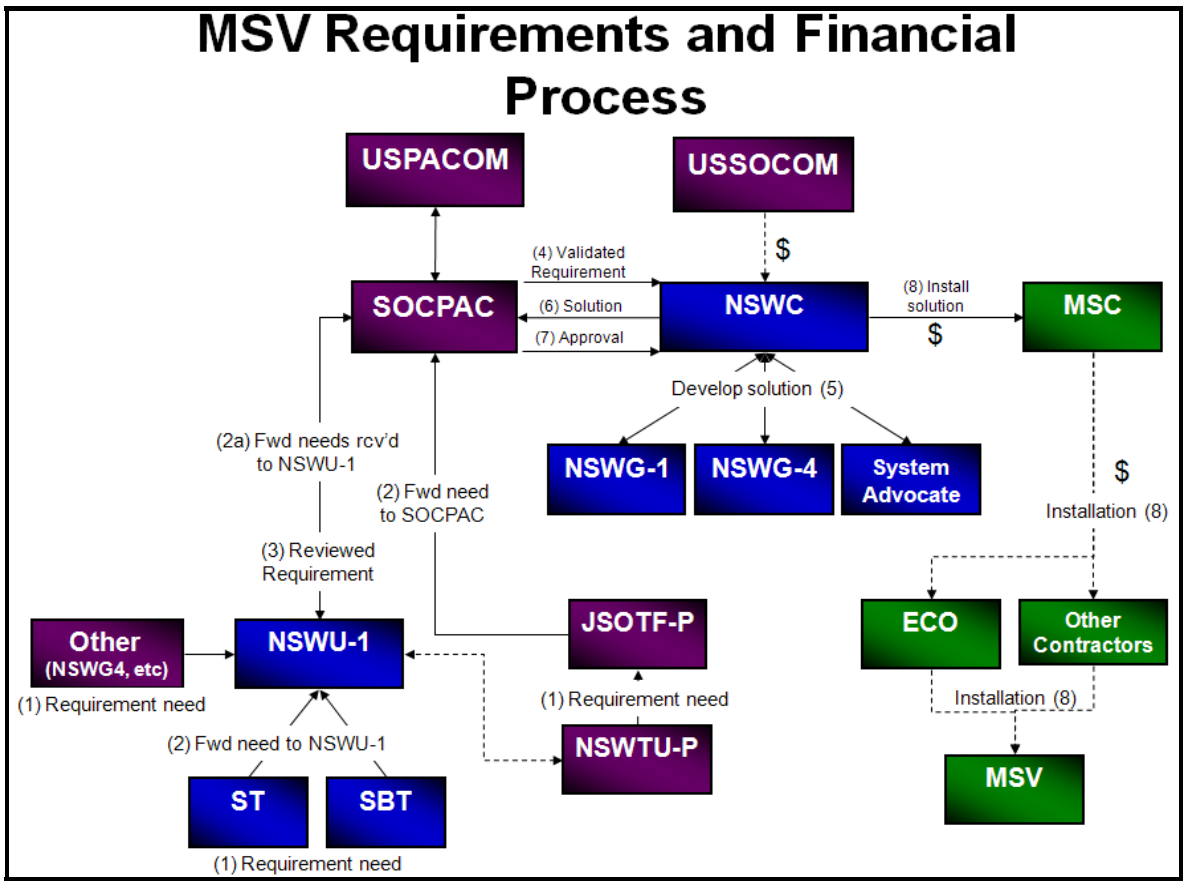

Figure 15. MSV Requirements and Financial Process
(NAVSPECWARCOM, 2009)

G. Logistics and Support

As mentioned previously, the MSV's crew consists of 12 civilian contractors employed by ECO. Since the vessel maintains a persistent presence in the area of operations, members of the crew are swapped out every few months. Also, there is an MSV Officer in Charge (OIC/Navy O-3) and an MSV Senior Enlisted Advisor (SEA/Navy E-7) who are Individual Augmentees (IAs) provided by Commander US Pacific Fleet (COMPACFLT) and are responsible for coordinating logistical and operational support between the MSV's crew and embarked service members. The OIC and SEA are also responsible for proper liaison between the various levels of the chain of command. There is also an SOF-experienced communicator onboard, provided by SOCPAC.

On average, the MSV remains underway for 25 days and in port for five days. The MSV consumes on average about 4,000 Diesel Fuel Marine (DFM) gallons per day while transiting at 10 to 12 knots, 2,000 DFM gallons per day loitering, and 300 DFM gallons per day in port. While in port, the MSV crew conducts the necessary preventive and involved maintenance that they are unable to perform while underway.

One source of frustration for the MSC revolves around the issue of force protection, as stated in a letter to NSW from the PM2 program office:

> From an operational command and control perspective, the MSV presents some challenges to us. MSC usually relies on our local area commanders to maintain situational awareness of our forward deployed ships […]. Although we respect your need to maintain operational security for the missions, MSC must be afforded some level of visibility of ship location and force protection posture […]. In addition to using the information that is available through secure web sites, I would like to have MSC staff maintain more frequent contact with their SPECWAR counterparts. (NAVSPECWARCOM, 2009)

At the core of this issue is the need to maintain the operational security of a vessel working in a manner not typical of MSC ships. As a SOCOM asset, the MSV is outside the Seventh Fleet and Military Sealift Command, Southeast Asia, chain of command that applies to every other MSC ship in the Pacific. With the SOCPAC commander as the authority in the chain of command who approves force protection, the measures taken to ensure vessel and crew safety do not normally make it back to the MSC. Especially problematic is that the MSV operates with blanket clearances to enter coastal waters, and ECO arranges port visits like a commercial ship so that prior notification rules are very different. These procedures allow the MSV to enter a port with more assurances that its presence is not anticipated, let alone exploited, by some unfriendly elements of the population. The MSC has come to accept these procedures, even if it is not completely comfortable with them. Figure 16 depicts the chain of command for the MSV.

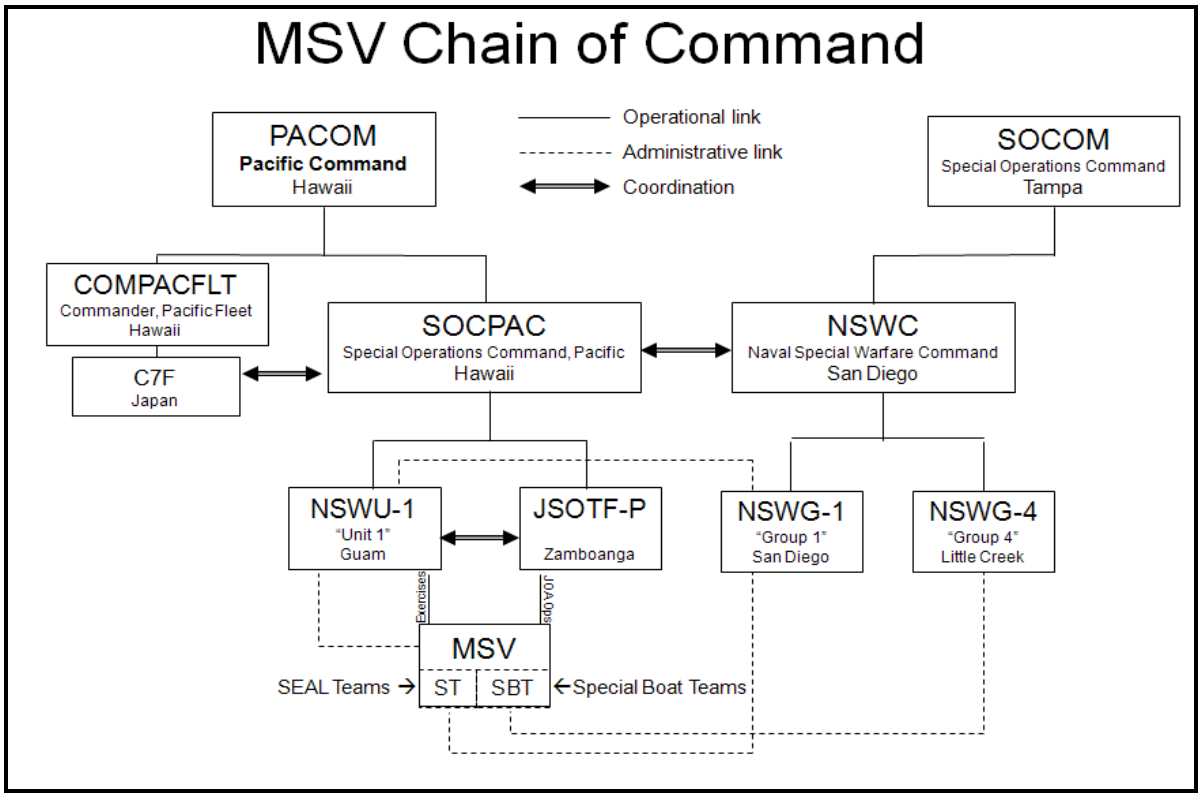

Figure 16. MSV Operational Chain of Command
(NAVSPECWARCOM, 2009)

H. Key Factors and Trade-offs

There are some key factors and trade-offs that need to be addressed in regard to both the characteristics of the MSV that are important but less than apparent and to the capabilities of the vessel that are obviously lacking but perhaps not as determinant.

The use of civilian mariners onboard vessels used for irregular purposes brings more flexibility than the use of military service members. It is arguable whether civilian mariners are more capable than their military counterparts, but in regard to transiting through and working within foreign ports, civilian mariners are less likely to raise suspicions about the intentions of the vessels they work on compared to US Sailors working onboard a similar-type vessel. Civilian mariners working on commercial vessels tend to blend in better with the local population and

are more familiar with coordinating with husbanding agents to facilitate services and supplies when visiting a foreign port. Civilian mariners are also not restricted by the same rules that US Service members are required to follow when visiting foreign ports. This is an attractive element when it comes to the use of chartered crews to support missions that require a ship and its crew to more or less hide in plain sight.

Another element of the MSV that may have a surprising impact on the MIW mission—and that is a direct consequence of the ship itself—is the ship's paint scheme. The color of the MSV is bright orange—or, more appropriately, Chouest orange—a color that no company besides ECO uses and, therefore, does not carry with it the normal associations that a US warship does. All countries across the globe associate gray-hulled ships with US warships.[4]

There are some capabilities that are lacking from the MSV, such as the ability to launch and recover unmanned aerial vehicles (UAVs) and helicopters. These capabilities are very important and would be expected to be essential requirements that should have been included in the original requirements list. These capabilities would have driven up costs significantly and may have also delayed the delivery date of the vessel. While these are limitations of the current MSV, there is debate between the MSV stakeholders about whether to expand the requirements to include

[4] One MSC official offered up a scenario based on a personal experience in which he was standing on a pier in a foreign port looking out to sea, watching as a few US-flagged vessels were anchoring off of the coast. All of the ships were leased vessels, and this official had been involved with each of the ships' contracts. Of the ships that were there, one was painted in a black and white scheme and was carrying very sensitive material onboard. The other was a grey-hulled prepositioning ship that was only carrying equipment, vehicles, and rations to support ground forces in case of major conflicts. A local person walked up to him and asked all about the grey-hulled ship, completely overlooking the black and white vessel carrying the more sensitive and more interesting cargo. This example only serves to demonstrate how something so simple as the color of a ship may actually have the most influence over the local population. If it looks like a US warship, then no matter what its mission really is, it will be thought of as a warship.

both of these capabilities in future MSV platforms because doing so may actually entail a fundamental shift in mission away from primarily supporting boat operations.

THIS PAGE INTENTIONALLY LEFT BLANK

VI. Vessel Requirements and Capabilities

A. Need

As national security objectives continue to be addressed abroad, one of the biggest challenges facing the Department of Defense (DoD) is the dilemma of obtaining and maintaining forward bases. SOF is at the forefront of these objectives, and the need to maintain operational flexibility to counter political anti-access and irregular warfare challenges requires some sort of Afloat Forward Staging Base (AFSB) to provide flexible and sustainable locations from which to operate. While it is true that any US combative vessel offers overwhelming firepower dominance over most of her adversaries' vessels, political sensitivity does not allow for their presence (Corpening, Hurry & Young, 2006).

An AFSB is not necessarily the end-all be-all solution to the anti-access challenge, but it is important to understand the weight of its role. Having a staging vessel at sea clearly benefits all joint forces. Maneuver space and sovereignty of the seas can be exploited, enabling combatant commanders enhanced operational flexibility and effectiveness as well as increased safety and protection from land-based enemy forces. When establishing a shore base, the enemy knows from where US power is going to be projected. With an AFSB, such as the current Maritime Support Vessel, the enemy is constantly guessing (Corpening, Hurry & Young, 2006).

B. Operational Missions

To generate requirements for an MSV, the operational missions this vessel would be involved with first had to be examined by all stakeholders. First and foremost, the MSV was going to serve as an AFSB with SOF living onboard. It would offer maritime mobility and move equipment and people around. It had to have the capability to offer small-boat refueling, thereby extending visit, board, search, and

seizure (VBSS) range. The vessel needed to serve as a platform for Theater Security Cooperation Planning, render aid to other nations, and fulfill the role of Liaison Coordination Element Logistics Support in support of small detachments ashore. The requested MSV had to aid in operational preparation of the given environment, serve as a potential Maritime Craft Air Delivery System (MCADS) recovery platform, and act as a potential Unmanned Aerial Vehicle and dive support platform (NAVSPECWARCOM, 2009).

1. Requirements

The requirements sent to the MSC for a commercial vessel to be used by the US military in the Southeast Asian (SEA) littorals were a conglomeration of positions generated by NAVSPECWARCOM, SOCPAC, and NSWG-4. These entities then came to a consensus, and the requirements were sent to the MSC for action. These requirements will be further explored by the authors to illustrate how the current MSV came to be.

According to NAVSPECWARCOM, and as previously described, to conduct operations in support of JSOTF–P, SOF required "a mother ship for NSW combatant craft designed to transport personnel, equipment and supplies to remote locations that [couldn't] be reached with larger vessels" (NAVSPECWARCOM, 2009). This vessel needed to act as a maritime mother craft, supporting various organic and non-organic maritime assets. It had to be a maritime surface support platform to launch and recover, refuel, rearm, and provide maintenance for small boats. Furthermore, the MSV needed to provide berthing and habitability for the ship's civilian crew and at least 30 military personnel for 30 days without resupply. Ordnance, Diesel Fuel Marine (DFM), Motor Gasoline (MOGAS), and specialized communication equipment were required to be stored as well. The vessel had to have an endurance of a minimum of 30 days at sea, to include 20 days on station supporting personnel and boats, with a range of at least 10,000 nautical miles (nm) at a speed of 12 knots.

2. Resulting MSV Capabilities

As we have said, the result of this inquiry was an orange-hulled, white-superstructure, modified, ocean-going tugboat built by Edison Chouest and known as *C-Champion*. *C-Champion*'s basic characteristics and capabilities are illustrated in Figure 17.

Characteristics	
Draft	16.5 ft
Length	220 ft
Beam	56 ft
Engineering	(3) Diesel Catapillar Z-drives; 1 FWD, 2 AFT
Cargo	Embark up to 4 NSW 11-meter RHIBs or similar craft, 4 boat davits, 15-ton crane + open deck with 4 weapons/ammo boxes
Speed	10 kts
Crew Size	30 SOF / 12 Civ Crew
Fuel Capacity	65,000 gal DFM/2,200 gal MOGAS
Endurance (20 % Reserve)	13 days @ 10kts (4000 gal/day); 26 days @ 5 kts (2000 gal/day)
Air Assets	None
Medical Capabilities	1 Corpsman; Medical Space (240X114); 2 tables, Deep sink
Communications Suite	UHF, VHF, SAT Comms, Tactical Comms
Armament	2 X .50 Cal (Max Effective Range: 2000 meters, military use only)

Figure 17. MV *C-Champion*
(NAVSPECWARCOM, 2009)

Another modification to *C-Champion* was the addition of an operations/habitability module. This two-level module, placed on the main deck of the MSV, offers a multitude of facilities. The main level includes a medical space, a machine shop, and seven two-man staterooms. The 01 level includes a lounge/briefing room, communication space, planning space, office space, and an exercise room. This module can be modified to suit operational needs (NAVSPECWARCOM, 2009).

C. Wargaming Scenario

To further aid in the analysis of vessel capabilities, the OA4604 Wargaming Applications course within the Operations Research curriculum of the Graduate School of Operations and Information Sciences (GSOIS) at the Naval Postgraduate School assisted us in constructing a wargame scenario. We selected three candidate ships to be used in a scenario in the Philippine Islands. The intent of the wargame and analysis was to compare and contrast the capabilities of the three candidate ships as well as their ability to successfully complete anticipated missions in the Philippines. The candidate ships were the Edison Chouest *C-Champion* (current MSV); the High-speed Vessel (HSV) *Joint Venture*, which conducted operations in the Philippine Islands in the early part of the decade; and the Littoral Combat Ship *USS FREEDOM* (LCS-1), which will potentially be operating in the littorals of Southeast Asia. Figure 18 identifies the three ships and their general capabilities, as utilized in the wargame.

	MV *C-CHAMPION*	HSV-2 *SWIFT*	LCS-1 *USS FREEDOM*
			
Speed:	12 knots	35 knots	45 knots
Length:	220 feet	331 feet, 4 inches	379 feet
Beam:	56 feet	87 feet, 5 inches	43 feet
Draft:	16.5 feet	11 feet	12.8 feet
Displacement:	2,106 tons	1,463.6 tons	3,089 tons
Civilian Crew:	14 contract mariners	17 contract mariners	0 contract mariners
Military Crew:	None	Mil crew as needed	40
Weapons:	2 x .50 cal	1 x 25mm, 2 x .50 cal, 2 x MK-19	1 x 57mm, 4 x .50 cal, RAM
Endurance:	13 days / 10kts	1 day / 35kts	1 day / 45kts
	26 days / 5kts	6 days / 20kts	7 days / 20kts
Helicopters:	No Air Assets	Helo Pad	2 x MH-60Rs
Small Boat Capacity:	4 x 11m RHIBs	2 x 11m RHIBs	2 x 11m RHIBs
Owned / Chartered:	Chartered	Chartered	Owned

Figure 18. Wargame Scenario Ships
(MSC, 2010b; PEO Ships, 2009)

1. Wargame Description

The exercise was an open-seminar wargame set in the Philippine Islands, adjudicated and run by a moderator and assisted by team members. The game board was a Google Earth display that included custom game-piece icons. The fuel gauge was an Excel program that calculated fuel burn and displayed the remaining-fuel level.

The scenarios for the three vessels were focused on supporting humanitarian and SOF operations relevant to what may be similar to a real-world situation in that region. Each vessel was run through four vignettes:

- Vignette 1: Support rescue operations of 400 victims and medical evacuation of three urgent surgical victims from a capsized ferry (humanitarian);

- Vignette 2: Transit to support insertion of SOF assets in response to a terrorist bombing and provide support for a medical emergency (SOF support);
- Vignette 3: Conduct noncombatant evacuation operations (NEO) of 12 American citizens (AMCITs) (SOF support); and
- Vignette 4: Defend against a coordinated speedboat attack (self-defense).

These vignettes were designed to evaluate (a) the ship's ability to accomplish designated missions (organic and inorganic asset utilization), (b) logistics requirements and limitations (fuel usage and duration at sea), and (c) the time to arrive on scene and complete evolutions. In the scenarios, the captains of the HSV and MSV were retired US Navy commanding officers, while the captain of the LCS was a former navigator for LCS-1.

a. Vignette 1: Humanitarian Assistance

In the first vignette, a ferry capsized near the island of Romblon. The vessel was 50 nautical miles away, and the ship's support was needed as soon as possible to quickly recover 400 personnel. The respective ship's captain needed to utilize assets (e.g., RHIBs, MH-60R, MK V, etc., if available) to recover personnel as quickly as possible. Each captain was presented with medical casualties from the capsizing and needed to provide medical support as well as transport casualties to proper facilities.

b. Vignette 2: SOF Support (Security Operations)

In the second vignette, there was an improvised explosive device (IED) attack on a government building on Negros Island. The vessel was 125 nautical miles away, and SOF support was needed as soon as possible. There was a medical casualty in this vignette that needed to be evacuated, so the responding vessel had to provide medical support by utilizing any assets available.

c. Vignette 3: SOF Support (NEO)

In this vignette, there was an increased hostility on the island of Negros that resulted in the need to evacuate American citizens from the embassy. The mission for the SOF was to evacuate 12 American citizens (AMCITs) from the island of Negros, which was 100 nautical miles from the vessel's location.

d. Vignette 4: Small-boat Attack

During the final vignette, the MSV was 20 nautical miles away from the port of Cebu, heading inbound, when three small boats began harassing the vessel. The ship's captain had to utilize whatever assets and capabilities were available in order to defend the ship against the small-boat attack.

2. Assumptions, Constraints, and Limitations

For the sake of the wargame, certain assumptions were put into effect:

- Fuel-burn rates for each ship
- Favorable weather
- US assets available
    - Special Operations Boat
- MARK V
- Maritime Patrol Aircraft
    - MH-60R
- Unmanned Aerial System (UAS)
    - Raven
- Rigid Hull Inflatable Boat (RHIB)
    - Capacity: 11 passengers (PAX) plus crew

There were stipulations within the exercise. Vessels were required to return to base whenever their respective fuel level was near or below 20% of the total fuel

capacity. There was only one possible logistic/services port (Cebu), and follow-on vignettes could not be executed with extra civilians onboard (from Vignette 1).

3. Scenario Results

The grounds for judging the most capable platform were based on mission-completion time, scenario-completion time, average speed, and fuel consumption as agreed upon by the authors, the Wargaming Applications course students, and the scenario/ship captains. The LCS was considered the most capable ship for the vignettes encountered due to its embarked helicopter detachment, its defensive capabilities, and its ability to deal with unforeseen emergencies (mainly because of the embarked helicopter detachment and its speed). The HSV was considered to be capable because of its speed and flight deck. However, utilization of the flight deck was dependent upon external assets; in the simulation, the needed asset was available, but it was two hours away. Furthermore, the high rate of fuel consumption of the HSV and its limited defensive measures were considered to be capability gaps for this platform. Finally, the *C-Champion* was seen as being severely limited in its ability to deal with unforeseen emergencies due to its slow speed and dependency on external assets. Yet, it stole the show in terms of fuel consumption—6,713 total gallons compared to 245,609 total gallons and 41,919 total gallons by the HSV and LCS, respectively.

D. Conclusions

We discussed the benefits of an Afloat Forward Staging Base (AFSB) earlier, but there are two distinct advantages of leasing a civilian vessel with a contracted civilian crew, as is the case with *C-Champion*:

- The nature of the ship's operation, and
- The nature of the crew.

Commercial ships are totally innocuous. That is, they are unlikely to arouse any strong feelings or hostility. This is primarily due to their appearance. With normal commercial colors, the local population is usually less concerned the presence of an MSV slowly making its way along the coastline. This ability to operate among the local population without drawing undesirable attention gives the government plausible deniability that any outside assistance is being rendered, and it allows the SOF embarked to inconspicuously complete its mission.

The nature of the crew also offers many advantages for SOF. The civilian crews are typically much more experienced than military crews, and although they may stand out in a foreign port, they still look like ordinary merchant seamen. Furthermore, civilian crews, under contract, allow for a much longer time on station and don't require as stringent of a force-protection package. While SOF personnel are constantly being rotated out on their regular deployment cycles, civilian crews on a "civilian" ship can spend a nearly unlimited time on station, thus ensuring the presence and availability of the MSV for various SOF elements in the region. Also, because the MSV is technically a non-combatant, it does not need diplomatic clearance to enter port for food, fuel, and other supplies, whereas a warship does require diplomatic clearance, possibly drawing negative attention.

The fact that the vessel is leased also offers an advantage. If there is a leak in operational security and the vessel is found to be an instrument of will, the ship contract can be terminated quickly. This allows for another MSV to be leased and brought onto station for continued operations in support of SOF.

Despite all of the advantages that a leased commercial vessel offers, stakeholders and decision makers still need to be aware that there are many limitations as one SOCOM official describes:

> The current MSV is not without its flaws. Being that it is a non-combative, it cannot enter a specific objective area. This means that it has no ability to assist SOF with long-range weapons. It does have two .50 caliber gun

mounts, but it must rely primarily on the embarked SOF and any available MK Vs for any real force protection when underway. Also, the current MSV has no intelligence, surveillance, or reconnaissance (ISR) capability, which is typically paramount in any SOF operation. (S. Armstrong, personal communication, March 5, 2010)

VII. Cost versus Capabilities Trade-offs

Based on a set of capabilities for each vessel type under analysis, we now calculate the cost per day of putting those capabilities on station at any given time. Evaluating each vessel on a cost-per-day basis provides decision-makers with a concrete assessment of the costs of deploying a specific capability for a given mission and further simplifies determining what those costs are over the anticipated duration of a mission.

For each vessel, we have collected data on the capital costs (such as acquisition and procurement), or lease costs, as well as on the operating and support costs. The cost data we collected for the Littoral Combat Ship (LCS) was taken from reports by the Congressional Research Service (CRS) and the Government Accountability Office (GAO) and is based upon US Navy cost estimates. Costs for the Maritime Support Vessel (MSV) *C-Champion* were collected from actual budget-and-spending documents at NAVSPECWARCOM. Costs for the High Speed Vessel (HSV) were obtained through conversations and correspondence with the Military Sealift Command (MSC) and are based upon actual costs in a previous lease contract for the HSV-2 *Swift*.

Table 2 shows the cost breakdown for the LCS in millions of dollars based upon estimates by the US Navy and analyzed by either the CRS or the GAO. Estimated costs for the LCS have increased significantly over time. The original LCS cost cap of $220 million per vessel[5] has since grown to $480 million per vessel for vessels procured beyond 2010 (O'Rourke, 2009).

[5] The original cost cap of $220 million per vessel was established in the FY2006 *Defense Authorization Act* (H.R. 1815/P.L. 109-163 of January 6, 2006). See O'Rourke (2009) for further discussion.

Table 2. LCS Unit, Operating and Support Costs

LCS-1	Cost
Unit cost	$480,000,000
Operating and Support Costs per year	$61,700,000
Cost per day	$221,644

The US Navy's estimate of $480 million per unit for the LCS-1 assumes a 25-year service life for the sea-frame and a 30-year service life for each of the four planned mission modules (the mine-warfare module, the antisubmarine warfare module, the surface-warfare module, and the maritime-security module). The $61.7 million per year in operating costs per vessel is an estimate that includes the cost to operate and support a mix of the two sea-frames plus one year of mission-module cost (GAO, 2010).[6] The sea-frame portion of the operating and support costs includes unit-level manpower, unit operations, maintenance, sustainment and support, system improvement, C4I, and disposal. The mission-module portion of the operating and support costs includes food and berthing, maintenance and repair, personnel, training, fuel, supplies, expendables, hardware, and engineering and technical support. While the $61.7 million estimate for operating and support costs may seem high for the LCS-1, it should be noted that these are estimates and that estimates for the LCS have tended to increase (rather than decrease) greatly over time. Therefore, these costs may represent close to a lower bound. To calculate the cost per day to deploy the LCS-1 for an MIW mission, we take the estimated cost per vessel of $480 million and divide it over the 25-year planned lifecycle, which gives a cost of $19.2 million per year. Next, we add the $61.7 million per year operating and support costs and divide the sum by 365 days, which results in ($19.2M + $61.7M) ÷ 365 = $222,000 per day.

[6] The one year of mission-module cost is a composite cost of each of the four planned mission modules. It includes a portion of the cost for each mission module. In 2008, the GAO reported the program unit cost of the surface warfare modules as $27.047 million, the anti-submarine warfare module as $57.046 million, and the mine countermeasures module as $40.665 million. No estimates were given for the maritime security module (GAO, 2010).

The HSV-2 *Swift* is a leased vessel that is currently operating as a Global Fleet Station Ship. The lease was for one year with three one-year options. The daily rate for the HSV-2 *Swift* was $50,000,[7] and we have estimated the annual lease cost based upon this daily rate to be $18.250 million ($50,000 × 365 days = $18,250,000). The food and berthing costs for the HSV-2 *Swift* were $30 per day for the 20-person military detachment, and we have estimated the total annual food and berthing costs (excluding the food and berthing costs for the civilian crew, which are already captured in the daily rate) to be $219,000 ($30 × 20 (person MilDet) × 365 days = $219,000). The fuel costs associated with both the LCS-1 and the HSV-2 can vary widely depending upon the number of days the vessel is at a particular speed. To estimate the fuel costs, we used fuel curves provided by the Military Sealift Command (see Table 3) and developed an operating-speed profile that assumes the number of days the vessel will have its engines running and the speed at which the vessel will be operating.

Table 3. Fuel Consumption of HSV

Speed	bbls/day	Gal/Hr	Gal/Day	Endurance (nm)
0	10	18	420	N/A
5	139	243	5,842	2,573
10	249	436	10,462	2,391
15	355	621	14,906	2,367
20	569	995	23,885	1,871
25	876	1,533	36,788	1,467
30	1,108	1,940	46,553	1,384
35	1,228	2,149	51,568	1,452

After discussions with the representatives at the Military Sealift Command (MSC) who were familiar with the HSV-2 *Swift*, we assumed the vessel would be operating at 25 knots or more due to the characteristics of the vessel and its

[7] The daily rate includes the costs of maintenance, repair, and civilian-contracted crew.

propensity to induce sea sickness in its crew when operating below this speed. Further, representatives from the MSC HSV program office stated that the HSV's best transit speed is 25 knots. These discussions and our wargame scenario results determined the HSV's fuel consumption and operating speeds, identified in Table 4. We assumed that the crew of an HSV deployed in an MIW environment would operate its engines 265 days per year and that on the other 100 days, the crew would perform maintenance or other engine downtime, such as port visits. The assumed operating-speed profile is given in Table 4. The HSV-2 *Swift* consumes 420 gallons per day at idle, 14,906 gallons per day at 15 knots, and 36,788 gallons per day at 25 knots. We have assumed that an HSV deployed in an MIW environment would idle less than 1% of the time and that it would operate at 15 knots 20% of the time and at 25 knots 80% of the time. Under this operating-speed profile, the annual fuel costs would be $26.626 million per year.[8]

Table 4. Fuel Costs of HSV

Speed (knots)	Fuel consumed (per day in gallons)	% of days assumed operating at speed	Number of gallons	Cost
0	420	0.00	111	$345
15	14,906	0.20	790,007	$2,449,023
25	36,788	0.80	7,799,014	$24,176,942
Total		1.00	8,589,132	$26,626,310

[8] The assumptions of operating speed and fuel consumption greatly impact total cost estimates.

Our estimate of the cost per day to bring a leased HSV on station to support MIW (Table 5) is $124,000—the sum of the lease cost ($18.250 million) + the operating costs, consisting of fuel, food, and berthing ($219,000 + $26.626 million) ÷ 365 days.

Table 5. HSV Lease, Operating and Support Costs

HSV-2 *Swift*	Annual Cost
Baseline Lease Costs	
Daily Rate	$18,250,000
Operating and Support Costs	
Food and Berthing (per year)	$219,000
Fuel	$26,626,000
Cost per day	$123,548

C-Champion is under a one-year firm-period lease with three one-year option periods and one 11-month option period. The baseline costs of the lease include the daily rate of $18,104 (or an annual daily rate of $6.608 million), WARCOM taxes of 5% on the total lease budget, and MSC administration costs (5% of the total lease cost). Actual FY09 costs for fuel were $2.2 million, port costs were $88,000, food and berthing costs were $84,000, and travel costs were $216,000, resulting in a total lease spend of $10.157 million. The cost per day to deploy *C-Champion* in the MIW environment is $28,000 ($7.569 million in baseline costs + $2.588 million in operating and support costs, then divided by 365) (see Table 6). Based on a Military Sealift Command lease-purchase analysis, an operating period of 10 years for the conversion of an existing vessel, and 14 years for a new vessel, are the breakeven points at which the cost to lease equaled the cost to purchase. From this study, the Assistant Secretary of the Navy concluded:

> [T]he lease-purchase analysis indicates in the long term, buying a vessel to meet the Naval Special Warfare/Special Operations Forces requirement may be more economical than continuing the charters. Further, assuming 25 years of productive service, preliminary findings are that a conversion would

be the most cost effective solution followed by a newly constructed vessel, and trailed by a continuous series of charters. (ASN RDA, 2009)

The lease-purchase analysis did not consider the value of flexibility or options enjoyed through a lease such as the ease of termination and disposal as well as the flexibility to change vessels in order to adapt to the ever-evolving nature of counterinsurgency and irregular operations.

Table 6. *C-Champion* Lease, Operating and Support Costs

C-Champion	Annual Costs
Baseline Lease Costs (FY09)	
Daily Rate	$6,608,000
WARCOM Tax (5%)	$512,000
MSC Administration costs (5%)	$449,000
Operating and Support Costs	
Fuel	$2,200,000
Port Costs	$88,000
Food and berthing (per year)	$84,000
Travel costs	$216,000
Cost per day	$27,827

Table 7 summarizes the cost analysis of the LCS-1, the HSV-2 *Swift* and the *C-Champion*. By calculating the cost per day to bring a particular vessel and its capabilities into an MIW environment, decision-makers are able to make informed choices about how to deploy different assets in different scenarios. The LCS-1 brings considerable ISR, maneuverability, and firepower to any operation relative to the HSV or *C-Champion*. However, it costs approximately $222,000 per day to do so. The HSV offers maneuverability and considerable capacity at a rate of approximately $124,000 per day. *C-Champion* offers utility and economy at approximately $28,000 per day.

Table 7. Summary of Vessel Costs per Day

	LCS-1	HSV-2 *Swift*	*C-Champion*
Unit cost	$480,000,000		
Baseline Lease Cost		$18,250,000	$7,569,000
Operating and Support Costs	$61,700,000	$26,845,000	$2,588,000
Cost per day	$221,644	$123,548	$27,827

THIS PAGE INTENTIONALLY LEFT BLANK

VIII. Recommendations

Earlier in this document, we discussed that maritime irregular warfare is multidimensional and that there are identifiable activities associated with its conduct (see Figure 2). Accordingly, there is no universal vessel appropriate for all MIW environments, either from a capability or cost perspective. To illustrate this point, we considered four hypothetical scenarios, similar to real-world areas of operation, with varying degrees of demand for each of the mission sets. These scenarios were intended for use as an instrument for discussing vessel applicability within certain contexts that may share characteristics of a specific geographic region or area of operations. Discussing each vessel in the context of a scenario demonstrated the type of cost and capability trade-offs that must be made when deciding what types of assets and resources should be deployed, assuming a mission duration and timeline, to achieve a desired result.

A. MIW Scenarios

In developing the hypothetical scenarios, we weighted MIW activity areas based on the team members' professional experience and on knowledge gained through the research process for this project. Figure 19 illustrates the distribution of the weighted percentages among the scenarios.

Maritime Irregular Warfare Activities	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Security Force Operations & Assistance	10%	20%	10%	20%
Civil-Military Assistance	10%		20%	10%
Counter-terrorism/piracy/narcotics	30%	70%	10%	50%
Building Maritime Partner Capability & Capacity	40%		60%	
Intelligence, Surveillance & Reconnaissance	10%	10%		20%

Figure 19. MIW Scenario

1. Scenario 1: Maritime Partnering, Capacity-building and Counterterrorism

Scenario 1 emphasized the building of maritime partner capability and capacity as well as counterterrorism with some degree of civil-military assistance, security force operations and assistance, and intelligence, surveillance, and reconnaissance (ISR). The primary objective in this scenario was to "win hearts and minds" in order to train a host nation's forces to combat terrorism and insurgency as well as provide effective humanitarian relief and rapid response in case of a disaster such as a typhoon or ferry sinking. In this type of situation, a prolonged presence should be anticipated and sustained support for forces would be required (not dissimilar from the distribution of activities in the Philippines as part of OEF–P). Many vessels have the capability to support this mission for a short period of time, but due to the extended loitering requirement, political sensitivity to a gray-hulled vessel parked on the horizon of coastal waters, and the cost associated with the extended dwell time, a maritime support vessel such as the M/V *C-Champion* might be preferable. While sleek and swift vessels such as LCS-1 and HSV can offer rapid response to a host of isolated situations within the scenario, their fuel consumption alone makes them cost-prohibitive. Furthermore, any extended presence of a gray-hulled vessel is going to attract the attention of the local population. For extended support of SOF in the region, a vessel such as the MV *C-Champion* would be the preferred option in our opinion. Its orange hull and white superstructure allow it to blend in with commercial vessels, while its slow, lethargic pace and capacious deck and habitability spaces offer low fuel consumption and provide a sustainable floating hotel for SOF. Additionally, because of its forward, permanently deployed status, only the initial and periodic transoceanic costs are applicable.

2. Scenario 2: Counterpiracy

In Scenario 2, the highest level of effort was placed upon counterterrorism, counterpiracy, and counternarcotics. SOF and conventional naval operations would

work together to fight against state sponsors of terrorism. From an MIW perspective, this would include maritime interdiction operations (MIO), which typically employ visit, board, search, and seizure (VBSS) teams. These teams may consist of SOF, conventional Sailors from ships' company, or Coast Guard Law Enforcement (LE) detachments. In this type of scenario, a slow, minimally armed commercial vessel would probably be less than ideal, as it is basically a floating target for even primitively equipped aggressors. Cost would be less of a factor, as a combatant commander would want a vessel with combative capability. Because of the incorporation of conventional naval operations, sustained SOF support would not be much of a requirement, since specific SOF boarding teams would probably be temporarily embarked on a combative vessel for limited periods of time. A littoral combat ship or frigate could perform this mission adequately, and, given an assumed heated environment in which pirates, terrorists or narco-traffickers are operating with impunity, political sensitivity to a warship off the coast would probably be irrelevant, as is the case in the vicinity of the Horn of Africa.

There are myriad examples that illustrate how a warship would be the preferred vessel in Scenario 2. Coalition forces are currently using warships off the east coast of Africa as command-and-control (C2) platforms as part of the region's counterpiracy effort. At the time of this project write-up, the *USS Farragut* (DDG 99) was serving as the flagship for Combined Task Force 151 (CTF-151) and encountered a situation in which the destroyer came to the aid of a tanker that was being pursued by pirates, eventually apprehending the pirates and disabling their skiff (MSNBC, 2010). Just a day prior, the frigate, *USS Nicholas* (FFG 47), came under attack during the night by a group of pirates. Supposedly, the pirates confused the lighting configuration of the frigate with that of a commercial vessel, only to be stunned and subdued when the vessel returned fire (MSNBC, 1 April 2010). These are just two of many instances that show the advantage of having a gray-hulled warship in that region of the world. However, just as the discussion of the Tanker War example illustrated, the use of smaller, slow, mothership-type

civilian vessels can be extremely effective when working in conjunction with small attack helicopters (AH-6 or similar) and/or combatant craft detachments (such as the MK-V).

3. Scenario 3: Maritime Capacity-building and Security Force Assistance

Scenario 3 described a context somewhat similar to that encountered in Scenario 1. However, in this scenario, the overarching emphasis was on building maritime partner capability and capacity as well as conducting Civil-Military Operations (CMO). In October 2007, US Naval Forces Europe launched the African Partnership Station (APS). The dock landing ship *USS Fort McHenry* (LSD 43) was deployed to the Gulf of Guinea to serve as a floating schoolhouse to provide "training focused on maritime domain awareness and law enforcement, port facilities management and security, seamanship/navigation, search and rescue, leadership, logistics, civil engineering, humanitarian assistance and disaster response" (Ploch, 2009). Different vessels (such as *C-Champion*) may serve as a platform for the African Partnership Station, but an amphibious warfare ship is most likely optimal to combatant commanders, as it provides ample room for cooperative military training, berthing, and medical facilities. These vessels have a minimal footprint onshore, and their relatively shallow draft allows them to pull into austere ports to perform a variety of community-relations projects. At the time of this study's publication, the *USS Gunston Hall* (LSD 44) was on the west coast of Africa fulfilling this role (Stratton, 2010).

4. Scenario 4: Counternarcotics and ISR

In the final scenario, we considered a context in which the counternarcotics mission was the primary focus. A fast and agile vessel would be preferred to intercept the stereotypical drug-runner speedboats that are often portrayed in the media. The US Navy commonly and successfully uses frigates with US Coast Guard LE detachments for this mission. The *USS Freedom* has been successfully

employed in this role as well. On March 11, 2010, the *USS Freedom* achieved its third drug seizure, disrupting a high-speed vessel and recovering 2 1/4 tons of cocaine during counter-illicit trafficking operations in US 4th Fleet's Area of Responsibility (www.navy.mil). However, a more cost-effective method for counternarcotics operations might be the employment of the PC-1 *Cyclone* Class. These patrol craft do not have as sophisticated of weapons systems as frigates or littoral combat ships, but they do have the speed and firepower to get the job done. LE detachments and special warfare teams can be embarked, and the PC's shallow draft allows it to proceed close to the beach, should any shoreline MIW missions need to be fulfilled. The RAND Corporation also conducted a study to examine the feasibility of using the PC-1 Class as a small ship for use in Theater Security Cooperation (TSC). The PC would be given an updated propulsion system and improved C2, as well as a stabilized 25-mm gun. Incorporating a mothership concept, RAND found that the PC-1 would be rendered fully capable in TSC (Button, Blickstein, Smallman, Newton, Poole & Nixon, 2008), and this would likely be a more cost-effective way to conduct MIW operations, as anticipated in Scenario 4.

B. Special Operations Forces Utility

While there may be some vessels with greater capability that could accomplish a particular SOF mission, it is important to recognize that such a vessel may actually have a decreased level of *SOF utility*. Through discussions with members of the SOF community, we found that the greater the ship's capabilities, the less it is dedicated and fully available to SOF and, therefore, the lower the ship's SOF utility. Figure 20 compares the SOF utility of a particular vessel to the vessel's overall capabilities, showing that the two are inversely proportional. This figure aligns the intensity of the political environment with the corresponding vessel that would be required, showing how political environment and ship capabilities are directly related.

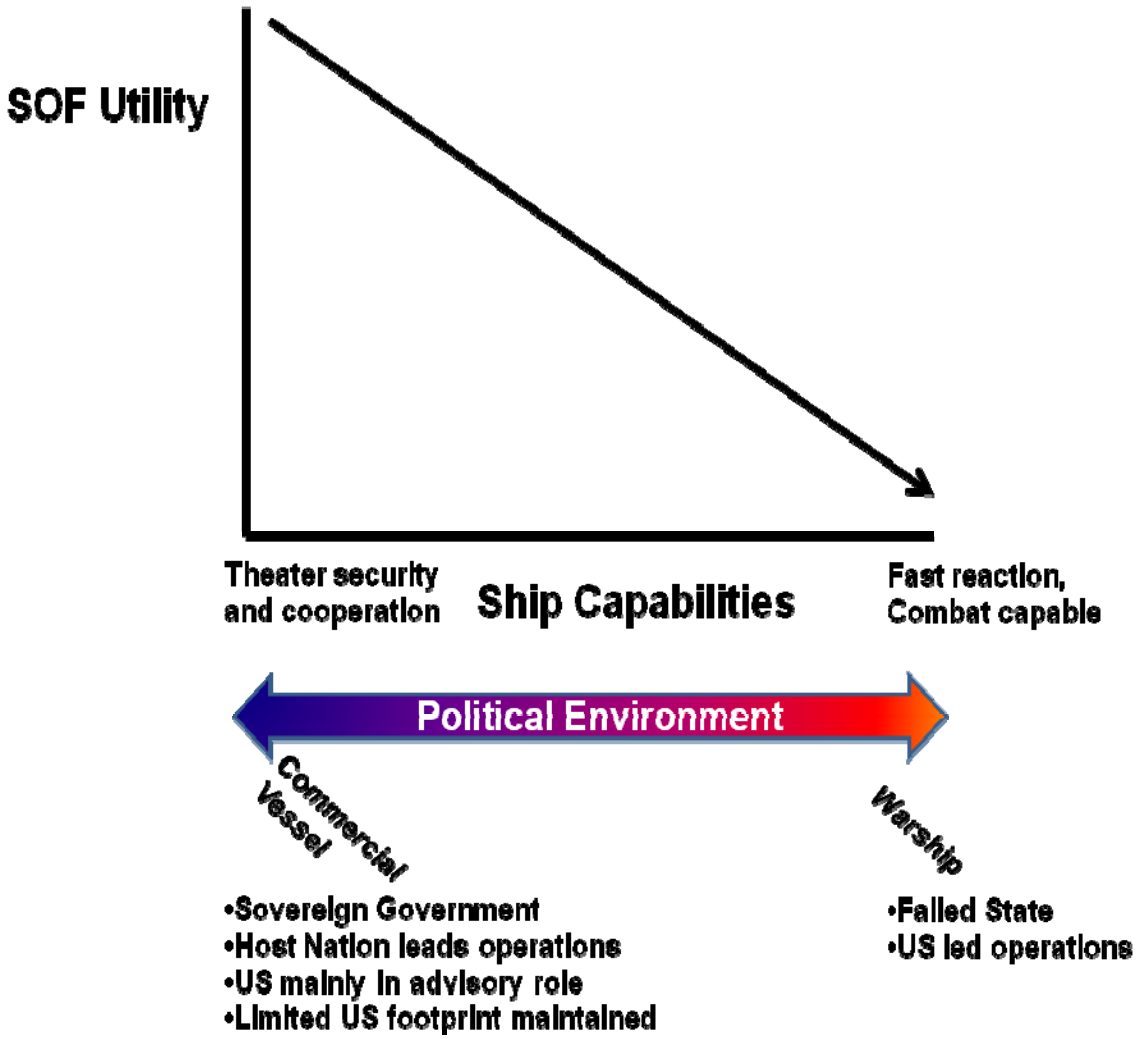

Figure 20. SOF Utility versus Ship Capabilities and Corresponding Political Environment

In a politically heated environment in which there is little to no governing authority, and cost is of little concern, a gray-hulled ship with a full complement of warfare capabilities would be required for quick response to a crisis or conflict and to take the lead in combat operations. While a combative may be able to provide support for SOF for a particular operation, its sustainability in a loitering role is questionable. Although required for heated conflict, a vessel with multiple warfare capabilities will eventually be assigned other tasks to exploit those capabilities, thereby limiting its role in SOF support. On the other end of the spectrum, in a

calmer setting in which a sovereign government exists and SOF is in a long-term advisory role, a cost-effective solution offering dedicated support and sustainability is required. In this type of scenario in which there is not a direct need for quick, lethal, and decisive force, a platform other than a gray-hulled warship may be desirable.

THIS PAGE INTENTIONALLY LEFT BLANK

IX. Conclusion

Global events constantly challenge the US military to respond to almost any scenario. Policy leaders, both military and civilian, must decide on the nation's objectives and strategies and then acquire the appropriate capabilities and platforms to meet those objectives and strategies. As the defense budget becomes more constrained, all viable options to pursue needed technologies or platforms should be considered. Our findings are consistent with those of Hughes et al. (2009) in their description of how the Navy can develop "a more distributed combat capability for sea control and the projection of national influence from the sea" through the acquisition of smaller, single-purpose vessels (Hughes, 2009). Because of the cost advantage of the MV *C-Champion,* two or three of these vessels could be deployed in an operational area at the same cost per day or less than an HSV or LCS, therefore ameliorating the disadvantage of being slowest to arrive at a scene of action.

Conventional nation-to-nation conflicts are not the norm in warfare. The US has used military force over 300 times since the American Revolution, and that includes only eleven declared wars and some sustained conventional conflicts. There have been roughly 30 major conflicts during the past decade, and only four actually occurred between nations (Jogerst, 2009). History shows that irregular warfare is a regular occurrence, and our Services are shifting to adapt to irregular challenges faced in this more common form of warfare. Gompert and Gordon (2008) found that the average length of an insurgency is more than a decade. If the US is to deploy maritime forces in support of counterinsurgency or irregular operations, then it is likely that assets deployed to support those forces will dwell for an extended period of time. Given the differentiated costs of the three vessels we studied as candidates to support MIW, it makes sense to send the vessel that provides the needed capability (as dictated by the tasks necessary to achieve a mission within a given region or MIW scenario), with the highest SOF utility, at the

lowest possible cost. Interestingly, the 10-year average duration for an insurgency coincides with the 10-year breakeven point for a lease versus conversion for a vessel similar to the *C-Champion* or 14 years for a newly built vessel (ASN RDA, 2009).

Our nation's leadership has identified the changing priorities in warfare. In 2009, Defense Secretary Robert Gates stated that military force structure needs "to be 50 percent focused on conventional warfare, 10 percent focused on irregular warfare and 40 percent focused on dual-use capability for either conventional or irregular warfare" (O'Rourke, 2009). The Services need to open more thorough lines of communication between the conventional military and the Special Operations communities in order to incorporate the strength of each community to offset the weaknesses in combating irregular challenges. Furthermore, there has to be collaboration in identifying and acquiring the proper platforms to support combating these challenges.

Although not the acquisition method typically preferred by the DoD, there are benefits to leasing/chartering vessels in support of MIW. The advantages that leasing/chartering could provide are lower upfront costs (if the cost of procurement is extended over the useful life of vessel), greater response, and better value for taxpayers' money, especially for those assets and platforms that do not require an extensive acquisition process and can be purchased commercial off-the-shelf (COTS) or contracted through commercial companies. Leasing/chartering offers far more flexibility in highly dynamic operational environments since option years can be exercised at the discretion of the lessor. The flexibility of exercising a future option allows the lessor to find the best vessel to meet current end-user requirements, whereas vessel procurement incurs a likely 30-year obligation to support, maintain, and utilize a vessel and limits the capacity to adapt to changing end-user requirements.

Under a different legislative context or regulatory climate, these options could once again be used. In the near future, the defense budget's anticipated growth in annual weapons investments may cause some politicians to become more open-minded to the leasing/chartering option if necessary systems cannot be acquired through traditional methods.

Based on the analysis and recommendations presented in this project, decision-makers will have a mechanism from which to make a more informed decision regarding the acquisition of vessels supporting MIW. The framework aligns specific vessels with their corresponding capabilities, on a cost-per-day basis. The cost-per-day comparison will aid commanders in determining the most appropriate vessel and the most cost-effective acquisition method.

THIS PAGE INTENTIONALLY LEFT BLANK

X. References

Arquilla, J. (2010, March/April). The new rules of war. *Foreign Policy*, (178), 60-69.

Assistant Secretary of the Navy, Research Development and Acquisition (ASNRDA) (2009, November 25). *Notification of pending award of a charter contract for service support craft (SSC) west coast time charter*. Memorandum.

Booth, W.C., Colomb, G.G., & Williams, J.M. (2008). *The craft of research* (3rd ed.). Chicago: University of Chicago Press.

Brookes, P. (2007). *Flashpoint: No bungle in the jungle*. Retrieved December 3, 2009, from http://www.armedforcesjournal.com/2007/09/2926516

Button, R.W., Blickstein, I., Smallman, L., Newton, D., Poole, M.A., & Nixon, M. (2008). *Small ships in theater security cooperation*. Santa Monica: RAND.

Chairman of the Joint Chiefs of Staff (CJCS). (2007, June). *The Department of Defense dictionary of military and associated terms* (Joint Publication 1-02). Washington, DC: US Government Printing Office. Retrieved January 3, 2010, from http://wstiac.alionscience.com/pdf/dodmilitarydictionary.pdf

Chief of Naval Operations (CNO). (2009, September). *CNO guidance for 2010: Executing the maritime strategy*. Washington, DC: US Government Printing Office. Retrieved April 3, 2010, from http://www.cffc.navy.mil/cnog_2010.pdf

Chief of Naval Operations (CNO). (2010, January). *The US Navy's vision for confronting irregular challenges*. Washington, DC: US Government Printing Office.

Cohn, S.C. (2007). *Countering the lingering threat of the Abu Sayyaf group* (Master's Thesis). Monterey, CA: Naval Postgraduate School.

Corpening, M., Hurry, L., & Young, G. (2006, August 25). *The role of seabasing in SOF operations*. Retrieved February 28, 2010, from http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA456860&Location=U2&doc=GetTRDoc.pdf

Daggett, S., & O'Rourke, R. (2005). *Defense procurement: Full funding policy-background, issues, and options for congress* (CRS RL31404). Washington, DC: Congressional Research Service.

DeLuca, P., & Hoffman, R. (2010). *Gauging future maritime irregular warfare.* Unpublished PowerPoint presentation. Santa Monica, CA: RAND.

Donnelly, T. (2010). *AFP acquires new 11-meter boats; JSOTF-P assists with training*. Retrieved March 23, 2010, from http://jsotf-p.blogspot.com/2010/02/afp-acquires-new-11-meter-boats-jsotf-p.html

England, V. (2008, March 28). US plays quiet role in the Philippines. *BBC*. Retrieved January 4, 2010, from http://news.bbc.co.uk/2/hi/asia-pacific/7316761.stm

Farris, S.L. (2009). *Joint Special Operations Task Force-Philippines* (Monograph). Fort Leavenworth, KS: United States Army Command and General Staff College.

Ferber, M.M. (1989). *GAO: Navy contracting-ship chartering practices of the military sealift command*. Washington, DC: GAO.

Francis, P.L. (2007). *Defense acquisitions: An analysis of the special operations command's management of weapon system programs* (GAO-07-620). Washington, DC: GAO.

GAO. (2010). *Littoral combat ship: Actions needed to improve operating cost estimates and mitigate risks in implementing new concept* (GAO-10-257). Washington, DC: GAO.

Gates, R.M. (2008, September 29). *National defense strategy*. Speech given to the National Defense University, Washington, DC.

General Services Administration, Department of Defense, National Aeronautics and Space Administration. (2010). *Federal acquisition regulation (FAR)*. Washington, DC: Author.

Gompert, D.C., & Gordon, J., IV. (2008). *War by other means: Building complete and balanced capabilties for counterinsurgency*. Santa Monica, CA: RAND.

Hensley, C.L. (2008). *Lease vs. purchase in defense acquisition* (Master's Thesis). Monterey, CA: Naval Postgraduate School.

Hughes, W.P., Kline, J., Otte, D., Calvano, C., Nussbaum, D., Twomey, C., Langford, G., Burton, D., and Franck, R. (2009). *The new Navy fighting machine: A study of the connections between contemporary policy, strategy, sea power, naval operations, and the composition of the United States fleet* (NPS-OR-09-002-PR). Monterey, CA: Naval Postgraduate School.

Jogerst, J.D. (2009, December 1). Preparing for irregular warfare: The future ain't what it used to be. *Air & Space Power Journal*, 68-78. Retrieved March 13, 2010, from http://www.airpower.maxwell.af.mil/airchronicles/apj/apj09/win09/win09.pdf

JSOTF–P PAO. (2009, April 1). *Fact sheet*. Retrieved December 4, 2009, from Joint Special Operations Task Force–Philippines website: http://jsotf-p.blogspot.com/2009/04/jsotf-p-fact-sheet.html

Kaplan, R.D. (2005). *Imperial grunts: On the ground with the American military, from Mongolia to the Philippines to Iraq and beyond.* New York: Random House.

Keating, T.J. (2009). Prepared statement before the SASC on US Pacific Command posture. Washington, DC: Senate Armed Services Committee.

Lum, T., & Niksch, L.A. (2009). *The Republic of the Philippines: Background and U.S. relations*. Washington, DC: Congressional Research Service.

Military Sealift Command (MSC). (2010a). *Military sealift command: Command relationships*. Retrieved January 3, 2010, from http://www.msc.navy.mil/N00P/overview.asp?page=cr

Military Sealift Command (MSC). (2010b). *MSC ship inventory.* Retrieved January 3, 2010, from http://www.msc.navy.mil/inventory/

MSNBC. (2010, April 1). *US Navy frigate captures pirate mother ship*. Retrieved April 7, 2010, from http://www.msnbc.msn.com/id/36131357/ns/world_news-africa/?ns=world_news-africa

MSNBC. (2010, April 2). *US warship destroys pirate vessel*. Retrieved April 7, 2010, from http://www.msnbc.msn.com/id/36146664/

Mullins, M. (2009). *Navy irregular warfare*. Unpublished PowerPoint presentation. Navy Irregular Warfare Office. Retrieved March 7, 2010, from http://navexfor.com/uploads/NX-Irregular_Warfare_Office.pdf

Naval Special Warfare Command (NAVSPECWARCOM). (2008). *MSV lessons learned.* Unpublished PowerPoint presentation. Internal brief, NAVSPECWARCOM.

Naval Special Warfare Command (NAVSPECWARCOM). (2009). *Maritime support vessel*. Unpublished PowerPoint presentation. Internal overview brief, NAVSPECWARCOM.

Naylor, S.D. (2009, September 27). *SOCOM reportedly wins budget battle*. Retrieved January 3, 2010, from http://www.navytimes.com/news/2009/09/navy_socom_092309w/

Office of Management and Budget (OMB). (1992). *Preparation, submission, and execution of the budget* (Circular No. A-94). Washington, DC: Author.

Office of Management and Budget (OMB). (2009). *Preparation, submission, and execution of the budget* (Circular No. A-11). Washington, DC: Author.

O'Rourke, R. (2009). *Navy role in irregular warfare and counterterrorism: Background issues for congress (RS22373)*. Washington, DC: Congressional Research Service.

Palilonis, D.C. (2009). *Operation enduring freedom—Philippines: A demonstration of economy of force* (NWC Final Paper). Newport, CA: Naval War College.

Philippines. (2009). *The world factbook*. Retrieved December 15, 2009, from https://www.cia.gov/library/publications/the-world-factbook/geos/rp.html

Ploch, L. (2009, October 2). *Africa command: U.S. strategic interests and the role of the U.S. military in Africa*. Retrieved April 3, 2010, from Federation of American Scientists website: http://www.fas.org/sgp/crs/natsec/RL34003.pdf

Program Executive Office (PEO) Ships. (2009). *LCS fact sheet*. Retrieved December 4, 2009, from http://peoships.crane.navy.mil/Ships.htm

San Miguel, J.G., Shank, J.K., & Summers, D.E. (2005). *Navy acquisition via leasing: Policy, politics, and polemics with the maritime prepositioning ships* (Professional Report). Monterey, CA: Naval Postgraduate School.

Stratton, J. (2010, March 11). *Africa partnership station USS Gunston Hall arrives in Ghana*. Retrieved April 7, 2010, from US Africa Command website: http://www.africom.mil/getArticle.asp?art=4150&lang=0

Sutton, W.R. (2000). *Maritime irregular warfare: A long-range view* (Master's Thesis). Monterey, CA: Naval Postgraduate School.

Tirpak, J.A. (2004, February). Tanker twilight zone. *Airforce Magazine*, *87*(2), 47-50. Retrieved January 7, 2010, from http://www.airforce-magazine.com/MagazineArchive/Documents/2004/February%202004/0204tanker.pdf

Tompkins, M.L. (2008). Value, cost, obsolescence contract for change, challenges ahead. Retrieved December 6, 2009, from http://www.dau.mil/pubscats/PubsCats/PM/articles94/Tompkins.txt

Under Secretary of Defense (AT&L). (2008). *Irregular warfare* (DoD Directive 3000.07). Washington, DC: Author.

US Navy. (2010). *USS Freedom achieves third Caribbean drug seizure*. Retrieved April 8, 2010, from http://www.navy.mil/search/display.asp?story_id=51928

US Navy, US Marine Corps, US Coast Guard. (2007). *A cooperative strategy for 21st century seapower*. Washington, DC: US Government Printing Office. Retrieved January 3, 2010, from http://www.navy.mil/maritime/Maritimestrategy.pdf

Whatley, S.L. (1996). *Centralization or decentralization? A case study of the Military Sealift Command's special mission program* (Master's Thesis). Monterey, CA: Naval Postgraduate School.

Wiggins, J.F. (1999). *GAO: Defense acquisition—Historical insights into Navy ship leasing* (GAO/T-NSIAD-99-141). Washington, DC: GAO.

Zatarain, L. (2008). *Tanker war: America's first war with Iran, 1987-1988.* Drexel Hill, PA: Casemate Publication.

THIS PAGE INTENTIONALLY LEFT BLANK

2003 - 2010 Sponsored Research Topics

Acquisition Management

- Acquiring Combat Capability via Public-Private Partnerships (PPPs)
- BCA: Contractor vs. Organic Growth
- Defense Industry Consolidation
- EU-US Defense Industrial Relationships
- Knowledge Value Added (KVA) + Real Options (RO) Applied to Shipyard Planning Processes
- Managing the Services Supply Chain
- MOSA Contracting Implications
- Portfolio Optimization via KVA + RO
- Private Military Sector
- Software Requirements for OA
- Spiral Development
- Strategy for Defense Acquisition Research
- The Software, Hardware Asset Reuse Enterprise (SHARE) repository

Contract Management

- Commodity Sourcing Strategies
- Contracting Government Procurement Functions
- Contractors in 21st-century Combat Zone
- Joint Contingency Contracting
- Model for Optimizing Contingency Contracting, Planning and Execution
- Navy Contract Writing Guide
- Past Performance in Source Selection
- Strategic Contingency Contracting
- Transforming DoD Contract Closeout
- USAF Energy Savings Performance Contracts
- USAF IT Commodity Council
- USMC Contingency Contracting

Financial Management

- Acquisitions via Leasing: MPS case
- Budget Scoring
- Budgeting for Capabilities-based Planning
- Capital Budgeting for the DoD
- Energy Saving Contracts/DoD Mobile Assets
- Financing DoD Budget via PPPs
- Lessons from Private Sector Capital Budgeting for DoD Acquisition Budgeting Reform
- PPPs and Government Financing
- ROI of Information Warfare Systems
- Special Termination Liability in MDAPs
- Strategic Sourcing
- Transaction Cost Economics (TCE) to Improve Cost Estimates

Human Resources

- Indefinite Reenlistment
- Individual Augmentation
- Learning Management Systems
- Moral Conduct Waivers and First-tem Attrition
- Retention
- The Navy's Selective Reenlistment Bonus (SRB) Management System
- Tuition Assistance

Logistics Management

- Analysis of LAV Depot Maintenance
- Army LOG MOD
- ASDS Product Support Analysis
- Cold-chain Logistics
- Contractors Supporting Military Operations
- Diffusion/Variability on Vendor Performance Evaluation
- Evolutionary Acquisition
- Lean Six Sigma to Reduce Costs and Improve Readiness

- Naval Aviation Maintenance and Process Improvement (2)
- Optimizing CIWS Lifecycle Support (LCS)
- Outsourcing the Pearl Harbor MK-48 Intermediate Maintenance Activity
- Pallet Management System
- PBL (4)
- Privatization-NOSL/NAWCI
- RFID (6)
- Risk Analysis for Performance-based Logistics
- R-TOC AEGIS Microwave Power Tubes
- Sense-and-Respond Logistics Network
- Strategic Sourcing

Program Management

- Building Collaborative Capacity
- Business Process Reengineering (BPR) for LCS Mission Module Acquisition
- Collaborative IT Tools Leveraging Competence
- Contractor vs. Organic Support
- Knowledge, Responsibilities and Decision Rights in MDAPs
- KVA Applied to AEGIS and SSDS
- Managing the Service Supply Chain
- Measuring Uncertainty in Earned Value
- Organizational Modeling and Simulation
- Public-Private Partnership
- Terminating Your Own Program
- Utilizing Collaborative and Three-dimensional Imaging Technology

A complete listing and electronic copies of published research are available on our website: www.acquisitionresearch.org

THIS PAGE INTENTIONALLY LEFT BLANK

ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL
555 DYER ROAD, INGERSOLL HALL
MONTEREY, CALIFORNIA 93943

www.acquisitionresearch.org