NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

AVOID LEAKS: FIXING THE MARITIME DRUG INTERDICTION ASSET CRISIS

by

Christian S. Capistrano

December 2018

Thesis Advisor: Rodrigo Nieto-Gomez
Second Reader: Robert L. Simeral

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE	*Form Approved OMB No. 0704-0188*

1. AGENCY USE ONLY *(Leave blank)*	**2. REPORT DATE** December 2018	**3. REPORT TYPE AND DATES COVERED** Master's thesis

4. TITLE AND SUBTITLE AVOID LEAKS: FIXING THE MARITIME DRUG INTERDICTION ASSET CRISIS	**5. FUNDING NUMBERS**
6. AUTHOR(S) Christian S. Capistrano	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000	**8. PERFORMING ORGANIZATION REPORT NUMBER**
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A	**10. SPONSORING / MONITORING AGENCY REPORT NUMBER**

11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release. Distribution is unlimited.	**12b. DISTRIBUTION CODE** A

13. ABSTRACT (maximum 200 words)

The complete decommissioning of Navy frigates has produced a range of concerns regarding the United States' maritime interdiction mission to remove drug traffickers and prevent illicit drugs from reaching the homeland. As the principal interdiction tool in the high seas, Coast Guard cutters have reported a significant increase in maritime seizure of cocaine, which is aligned with the dramatic increase in supply. Due to the decrease in maritime interdiction assets, however, only one in every four maritime drug events is interdicted and the rest pass safely through the security gap. This thesis examines the Navy's newly acquired MK VI patrol boat to determine its suitability for the high seas. This is conducted through policy analysis of the Navy's counterdrug mission and technology assessment of the MK VI. The research determined that MK VI application in the high seas, versus the littorals, would not be suitable; however, the Navy can engage the problem with creative ideas to mitigate the challenges with the MK VI. This thesis proposes the allocation of MK VI to forward naval bases in SOUTHCOM. The MK VI is a cost-effective, capable, and versatile platform that would tremendously help the Navy avoid maritime drug event leaks.

14. SUBJECT TERMS U.S. Navy, U.S. Coast Guard, maritime security, drug interdiction, counterdrug operation, MK VI Patrol Boat, frigates, LCS, technology assessment, policy analysis, SOUTHCOM, JIATF-S	**15. NUMBER OF PAGES** 89
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	**18. SECURITY CLASSIFICATION OF THIS PAGE**	**19. SECURITY CLASSIFICATION OF ABSTRACT**	**20. LIMITATION OF ABSTRACT**
Unclassified	Unclassified	Unclassified	UU

NSN 7540-01-280-5500 Standard Form 298 (Rev. 2-89) Prescribed by ANSI Std. 239-18

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release. Distribution is unlimited.

AVOID LEAKS: FIXING THE MARITIME DRUG INTERDICTION ASSET CRISIS

Christian S. Capistrano
Lieutenant, United States Navy
BA, University of San Diego, 2012

Submitted in partial fulfillment of the
requirements for the degree of

**MASTER OF ARTS IN SECURITY STUDIES
(HOMELAND SECURITY AND DEFENSE)**

from the

**NAVAL POSTGRADUATE SCHOOL
December 2018**

Approved by: Rodrigo Nieto-Gomez
Advisor

Robert L. Simeral
Second Reader

Afshon P. Ostovar
Associate Chair for Research, Department of National Security Affairs

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

The complete decommissioning of Navy frigates has produced a range of concerns regarding the United States' maritime interdiction mission to remove drug traffickers and prevent illicit drugs from reaching the homeland. As the principal interdiction tool in the high seas, Coast Guard cutters have reported a significant increase in maritime seizure of cocaine, which is aligned with the dramatic increase in supply. Due to the decrease in maritime interdiction assets, however, only one in every four maritime drug events is interdicted and the rest pass safely through the security gap. This thesis examines the Navy's newly acquired MK VI patrol boat to determine its suitability for the high seas. This is conducted through policy analysis of the Navy's counterdrug mission and technology assessment of the MK VI. The research determined that MK VI application in the high seas, versus the littorals, would not be suitable; however, the Navy can engage the problem with creative ideas to mitigate the challenges with the MK VI. This thesis proposes the allocation of MK VI to forward naval bases in SOUTHCOM. The MK VI is a cost-effective, capable, and versatile platform that would tremendously help the Navy avoid maritime drug event leaks.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

LIST OF FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

C4ISR	Command, Control, Computer, Communication, Intelligence, Surveillance, and Reconnaissance
CBP	Customs and Border Protection
DEA	Drug Enforcement Administration
DoD	Department of Defense
DON	Department of the Navy
FBI	Federal Bureau of Investigation
FFG[X]	Guided Missile Frigate
FSA	Force Structure Assessment
GPS	Global Positioning System
JIATF-S	Joint Interagency Task Force South
LCAC	Landing Craft Air Cushion
LCS	Littoral Combat Ship
LPD	Landing Platform Dock
OHP	Oliver Hazard Perry
RADAR	Radio Detection and Ranging
SBI	SAFE Boats International
SCCS	Ship Command and Control System
STIP	Scope, Technology, Impact, Policy
TCO	Transnational Criminal Organization
UNODC	United Nations Office on Drug and Crimes
UAV	Unmanned Aerial Vehicle
USV	Unmanned Surface Vehicle
UUV	Unmanned Underwater Vehicle

THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGMENTS

I would like to take this opportunity to gratefully thank Dr. Rodrigo Nieto-Gomez and Captain (Ret) Robert Simeral for guiding me to the pathway for success. The thesis process took me in many different areas where I felt like I was lost, but that is precisely what research is and Professor Nieto's tremendous guidance ensured that I stayed the course. It has definitely been a privilege to work with these accomplished professionals.

One thing that Professor Nieto said that stuck with me is that when I hit a road block, that just means that I'm a little wiser about the topic and know things that I did not know before…subject-matter expertise is exactly that—I hit my head against the brick wall more than other people. The topic made much more sense to me because of those road blocks. I think this will apply to my everyday life, and it is something that I will for sure take with me in my professional career.

I would also like to Dr. Carolyn Halladay for her guidance, inspiration, and tremendous support. As my academic advisor, Dr. Halladay has been there for everything from day 1, regardless of whether she's in the country or not. She is an awesome advisor, one who will go the distance to help her students. I sincerely appreciate her help.

Last but not least, I would also like to take this opportunity to thank my wife and daughter—Kate and Katian Claire—for their support and love. This work was a huge and difficult endeavor and I wouldn't have made it to the finish line without their unconditional support and understanding. Kate's encouragement and love throughout my career has always been my guiding light; she is my principal source of motivation.

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

A. RESEARCH QUESTION

What are the strategic implications of integrating the MK VI patrol boat in the drug interdiction mission of the United States Navy?

B. PROBLEM STATEMENT

With the complete decommissioning of all United States Navy (abbreviated as "Navy" hereafter) Oliver Hazard Perry (OHP) class frigates in 2015, the Navy does not have any particular platform where its primary mission is drug interdiction. The frigates were initially built as a cost-efficient surface ship with anti-submarine and anti-air warfare capabilities to protect and escort other vessels.[1] Shortly after the end of the Cold War, frigates were transitioned to the maritime interdiction mission due to an increase in littoral operations.[2] Since there are no more Navy frigates in the inventory, maritime assets from the United States Coast Guard (abbreviated as "Coast Guard" hereafter) and Customs and Border Protection (CBP) are left to do their same maritime interdiction missions but now with much larger roles to play. Thus, the drug interdiction mission remains the same, but fewer capable ships exist in the inventory to conduct the mission.

The decommissioning of Navy frigates has produced a range of concerns in the maritime interdiction mission and in the homeland. First, the removal of frigates led to the overemployment of the Coast Guard cutters. In fact, beginning in fiscal year 2016, the Coast Guard increased its allocation of assets in the transit zones above historical levels.[3] Moreover, in fiscal year 2017, Coast Guard cutters spent 2,627 deployment days on station

---

[1] Dave Werner, "Last of Its Kind - Oliver Hazard Perry Class Frigates Sail into Naval History," *All Hands*, September 29, 2015, http://www.navy.mil/ah_online/deptStory.asp?id=91288&issue=3&dep=8.

[2] John Keller, "A Once-Proud Class of U.S. Navy Surface Warships Is Quickly Fading Away," *Military & Aerospace*, November 4, 2014, http://www.militaryaerospace.com/articles/2014/11/frigates-face-end.html.

[3] Office of Inspector General, *Review of U.S. Coast Guard's Fiscal Year 2016 Drug Control Performance Summary Report*, Report No. OIG-17-33 (Washington, DC: Department of Homeland Security, February 1, 2017), 4, https://www.oig.dhs.gov/sites/default/files/assets/2017/OIG-17-33-Feb17.pdf.

conducting interdiction missions and exceeded their target operational hours by 437 days.[4] These data show that in order to meet the drug interdiction objective—being present to deter and deny illicit activity in the transit zones—Coast Guard cutters have been required to stay on station longer. Longer deployment days are now needed because the Navy removed its surface asset dedicated to counterdrug activities in the transit zones.[5] Longer deployments are not ideal because it delays the maintenance time for cutters, but most importantly, it adds further stress to the Coast Guardsmen operating the equipment.

Second, no frigates on the high seas means fewer visible ships for deterrence, which creates a vulnerable security gap. Suspect vessels may not be monitored and interdicted because of the lack of these operational assets. Ships that are available may already be employed in a different area and therefore cannot be assigned to another mission simultaneously. Maritime security agencies cannot cover and patrol all 6 million square miles of the transit zone.[6] In fact, a 2016 Coast Guard report asserted that it received intelligence on possible suspect vessels but could not act on all of them due to capacity constraints.[7] In other words, drug traffickers get a "free pass" because there are no law enforcement assets nearby to intercept them, despite their location being known.[8] The absence of assistance to the mission from Navy frigates could therefore lead to vessels carrying illicit drugs reaching their destination despite being identified.

---

[4] Office of Inspector General, *Review of U.S. Coast Guard's Fiscal Year 2017 Drug Control Performance Summary Report*, Report No. OIG-18-43 (Washington, DC: Department of Homeland Security, January 30, 2018), 3, https://www.oig.dhs.gov/sites/default/files/assets/2018-02/OIG-18-43-Jan18.pdf.

[5] Office of Inspector General, *DHS Drug Interdiction Efforts Need Improvement*, Report No. OIG-17-09 (Department of Homeland Security, November 8, 2016), 4, https://permanent.access.gpo.gov/gpo76533/OIG-17-09-Nov16.pdf.

[6] United States Department of State, *2016 International Narcotics Control Strategy Report: Volume I - Drug and Chemical Control*, (Washington, DC: Department of State, 2016), https://www.state.gov/j/inl/rls/nrcrpt/2016/vol1/253221.htm.

[7] *"Strategic Challenges Facing Our Nation - U.S. Coast Guard Perspective*," U.S. Coast Guard, December 2, 2016, 1, https://www.work.uscg.mil/Portals/6/Documents/PDF/Strategic%20Challenges%20Facing%20our%20Nation_US%20Coast%20Guard%20Perspective_WITH%20COVER.pdf?ver=2016-12-12-142116-477.

[8] Donna Miles, "Interagency Task Force Mounts Aggressive Counterdrug Effort," *DoD News*, May 30, 2012, http://archive.defense.gov/news/newsarticle.aspx?id=116547.

Shortfalls in assets reduces the capacity to perform counterdrug operations. The number of maritime assets from the Coast Guard and CBP is limited. Current maritime border security strategies use assets from the Coast Guard and CBP that range from ships such as the Coast Guard cutters to unmanned aerial vehicles, but the assets in both agencies are limited in that they require personnel to staff and operate the equipment and downtime for maintenance and preservation.[9] Though more people could be hired to operate the equipment, the system limit only allows a certain number of assets to be employed at a given time, while others are at homeport being preserved and maintained. Capability is further reduced by not having enough flight deck capable ships. Flight deck capable ships were important in the interdiction mission because their embarked helicopters expanded the operational picture while the ship remained on station. But since the frigates' decommissioning, the surface flight deck support from the Navy has been absent, leaving the Coast Guard cutter as the only type of vessel that can support helicopters.

Since maritime asset capacities have been reduced, the interdiction operation effectiveness has been limited on the high seas. The frigates patrolled and deployed the high seas to deny drug smugglers access to transit zones and the capability to reach areas far from territorial waters was key in that it allowed the frigates to track and interdict suspect vessels as far away from the United States' coast as possible. However, with the removal of frigates from the asset inventory, a shortage of surface maritime assets exists in the high seas. The shortage of assets in the high seas is highlighted as one of the factors leading to the Coast Guard's decrease in its illicit drug removal rate for four consecutive fiscal years.[10]

To fix the problems created by the decommissioning of the frigates, this thesis analyzes a specific potential solution: could the Navy use the MK VI patrol boat to take the frigates' place in the drug interdiction mission? This thesis explores this potential

---

[9] U.S. Coast Guard, *Component Overview* (Department of Homeland Security, 2016), https://www.uscg.mil/Portals/0/documents/PTT_USCG1.pdf?ver=2016-09-06-163615-050; "From the Air and Sea," U.S. Customs and Border Protection, December 21, 2017, https://www.cbp.gov/border-security/air-sea.

[10] Office of Inspector General, *2017 Drug Control Performance*, 4.

avenue to solve the maritime asset capacity problem. First, the MK VI has the capability that the mission requires: it is multi-domain capable. The key capability of the MK VI platform is versatility in that it can be employed in multi-domain missions within the interdiction realm. With current assets, the Coast Guard and CBP have the option for surface and aerial missions. In contrast, the MK VI has the capability to deploy multiple security vehicles—aerial, surface, and subsurface—simultaneously.[11] Not only do its surface and aerial capabilities add to the Coast Guard and CBP's assets, but its unmanned underwater vehicle (UUV) also complements the mission by locating and identifying threats in the subsurface domain.[12] Additionally, the MK VI has enough room to carry the law enforcement team that would conduct the boarding of suspect vessels. These capabilities would enhance interdiction operations and assist the Coast Guard in the high seas and CBP in the littorals.

Second, the MK VI is relatively inexpensive. On average, the Navy spent about $194 million for each frigate.[13] Fifty-two frigates were built in the program totaling around $10 billion.[14] The cost to build one MK VI is around $15 million,[15] significantly cheaper compared to the frigates. With the $194 million frigate cost, the Navy could acquire roughly thirteen MK VI patrol boats. This would therefore save the U.S. government money, allocate funds somewhere needed, and allow the Department of the Navy (DON) to deploy more platforms to fill vulnerability gaps.

Lastly, the construction and delivery of the MK VI does not require a long lead-time. Currently, the Navy's contract with SAFE Boats International (SBI) is for a total of

---

[11] Tyler Rogoway, "The Navy's Long Overdue Smart & Deadly Patrol Boat Has Arrived," *Foxtrot Alpha*, September 7, 2014, https://foxtrotalpha.jalopnik.com/the-navys-long-overdue-smart-deadly-patrol-boat-has-a-1631598708.

[12] "Mark VI Patrol Boat," U.S. Navy, January 12, 2018, http://www.navy.mil/navydata/fact_display.asp?cid=4200&tid=2600&ct=4.

[13] Jerome H. Stolarow, *Navy's FFG-7 Class Frigate Shipbuilding Program and Other Ship Program Issues*, GAO-108301 (Washington, DC: Government Accountability Office, 1979), 4.

[14] Ryan P. Donohue, "US Navy Bloodhounds: Establishing a New Maritime Security Combatant," (master's thesis, Naval Postgraduate School, 2016), 13, https://calhoun.nps.edu/handle/10945/49445.

[15] Lawrence Albert Hajek, "MK VI: The Next Generation of Interdiction," Center for International Maritime Security, May 16, 2016, http://cimsec.org/mk-vi-next-generation-interdiction/23497.

12 MK VI patrol boats. The Navy intends to assign the MK VI patrol boats to the Navy Expeditionary Combat Command to primarily conduct critical infrastructure protection in the littorals.[16] Typically, a long waiting period exists due to designing and contracting with shipbuilders. In this case, however, the wait period is over. In fact, the first MK VI was completed and delivered in 2014, and two more were delivered in 2015. The Navy is expected to have all 12 patrol boats by March 2018.[17] Because of the short construction and delivery time, the MK VI will be able to assist the Coast Guard and CBP in the drug interdiction mission relatively soon.

By exploring this avenue and with these added capabilities, the MK VI's measurement of success can be viewed in various ways. First, success can be measured in terms of the Coast Guard's and CBP's productivity and efficiency. More assets available to the Navy could mean that the Coast Guard and CBP assets would not be over-stretched, which could potentially increase productivity and efficiency. The existence of MK VI patrol boats would allow other maritime security assets to focus on relatively smaller rather than larger geographical areas. Second, success could be measured in terms of the increase in number of apprehension or arrests of maritime law violators, and the decrease in the number of illegal border entries of illicit drugs.

If successful, the MK VI platform could possibly drive a change in the Navy's interdiction policy. The impact of success could be great in that more MK VI platforms would be available to assist the Coast Guard and CBP in providing assets for maritime security. The increase in maritime security assets would have a huge payoff. More security to patrol the high seas and monitor the transit zones could reduce the over-employment of Coast Guard cutters, minimize security gaps created by having fewer ships, and significantly decrease or stop further drug flowing to the homeland, which would potentially lead to a decrease in drug use and overdose by the population. The strategic implications of using patrol boats could be significant in that security agencies could have

---

16 "MK VI Patrol Boats," Naval Technology, accessed January 29, 2018, https://www.naval-technology.com/projects/mk-vi-patrol-boats/.

17 Naval Technology.

better management and control of territorial waters and more flexibility and mobility resulting from the distribution of assets.

The challenge to a new policy could be whether the Navy will expand the radius of its operations to the Coast Guard and CBP by involving Navy assets in all their counterdrug operations, or if Navy assets will be involved more in coastal policing operations.

C. LITERATURE REVIEW

This literature review comprises three sections that will establish the foundation of the thesis research question. The first section will review the state of maritime drug operations to determine how transnational criminal organizations (TCO) use maritime conveyances to transport illicit drugs. The second section will review the state of maritime interdiction operations in regards to assets shortfall, consequences, and mitigation. The last section will review the Navy ship acquisition process to explore the quality of procurement. Most of the recent literature that talks specifically about drug interdiction issues and the security agencies' shortfalls are government documents and reports, and testimonies of senior military officials.

1. State of Maritime Drug Operations

The majority of illicit drugs that enter the United States originate in South America. According to the *World Drug Report 2017*, the United Nations Office on Drug and Crimes (UNODC) stated that Colombian cultivation of coca plant increased to 96,000 hectares in 2017; the size is a dramatic 44 percent increase from the previous year and a level not seen since 2007.[18] North America, particularly the United States, remains the largest market for cocaine.[19] Rodrigo Nieto-Gomez asserted that banned illicit drugs follow supply and demand—grown and manufactured in a place where they have little market value and

[18] United Nations Office on Drugs and Crime, *World Drug Report 2017: Booklet 3 - Market Analysis of Plant-Based Drugs - Opiates, Cocaine, Cannabis* (Vienna, Austria: United Nations Office on Drugs and Crime, 2017), 25, https://www.unodc.org/wdr2017/field/Booklet_3_Plantbased_drugs.pdf.

[19] United Nations Office on Drugs and Crime.

exported to another where they are highly sought after.[20] But to reach their ideal market, illicit drugs must be arranged, packed, transported, and shipped via air, land, or sea.

a. Drug Trafficking Corridors

To transport over water, there are three likely corridors that literature discusses: Eastern Pacific, Western Caribbean, and Eastern Caribbean. In the *2017 National Drug Threat Assessment*, the Drug Enforcement Administration reported that the Eastern Pacific and Western Caribbean corridors were used by drug traffickers 93–94 percent of the time, where 82 percent was on the Pacific vector over the western Caribbean vector (see Figure 1).[21] This information is crucial in that these corridors are where the decommissioned Navy frigates used to operate and where Coast Guard cutters are currently operating. Michael P. Atkinson et al. further adds that the longer the route drug traffickers take measured from place of departure to destination, the more vessels are expected in the transit zone.[22] In their study, Atkinson et al. determined that the average distance along the Eastern Pacific corridor is 750 nautical miles, which makes it the longer route out of the three corridors. This result is further confirmed by the UNODC report which states that over two-thirds of cocaine transits the eastern Pacific corridor.[23] Drug traffickers use routes along these corridors to deliver their banned products to their destination. In a memorandum to the Secretary of State, President Barack Obama labeled Mexico and most of the Central American countries as transit destinations;[24] meaning those countries serve as the last stop

---

[20] Rodrigo Nieto-Gomez, "Stigmergy at the Edge: Adversarial Stigmergy in the War on Drugs," *Cognitive Systems Research* 38 (June 1, 2016): 31–40, https://doi.org/10.1016/j.cogsys.2015.12.005.

[21] United States Department of Justice Drug Enforcement Administration, *2017 National Drug Threat Assessment*, Report No. DEA-DCT-DIR-040-17 (Springfield, VA: Drug Enforcement Administration, October 2017), 93, https://www.dea.gov/docs/DIR-040-17_2017-NDTA.pdf.

[22] Michael P. Atkinson, Moshe Kress, and Roberto Szechtman, "Maritime Transportation of Illegal Drugs from South America," *The International Journal on Drug Policy* 39, (January 2017): 44. https://doi.org/10.1016/j.drugpo.2016.07.010.

[23] United Nations Office on Drugs and Crime, *World Drug Report 2017: Booklet 3 - Market Analysis of Plant-Based Drugs - Opiates, Cocaine, Cannabis*, 29.

[24] The White House, "Major Drug Transit or Major Illicit Drug Producing Countries for Fiscal Year 2017" (official memorandum, Washington, DC: The White House, 2016), https://obamawhitehouse.archives.gov/the-press-office/2016/09/12/presidential-determination-major-drug-transit-or-major-illicit-drug.

for maritime drug shipments where they are switched and transported to the United States via land. Overall, agreement exists among the current scholars that the primary transportation route is through the territorial waters in Eastern Pacific and Western Caribbean. The perspective of the literatures noted here, in general, agree on the three corridors. However, in an article by William E. Gibson, he explains that drug traffickers are adapting to the security environment that law enforcement in the two corridors leading to Central America and Mexico are increasing, and the result is a shift in drug smuggling via the eastern Caribbean route.[25] There has been an increase in smuggled illicit drugs off the coast of Florida, where traffickers use a variety of tactics and vessels.[26]

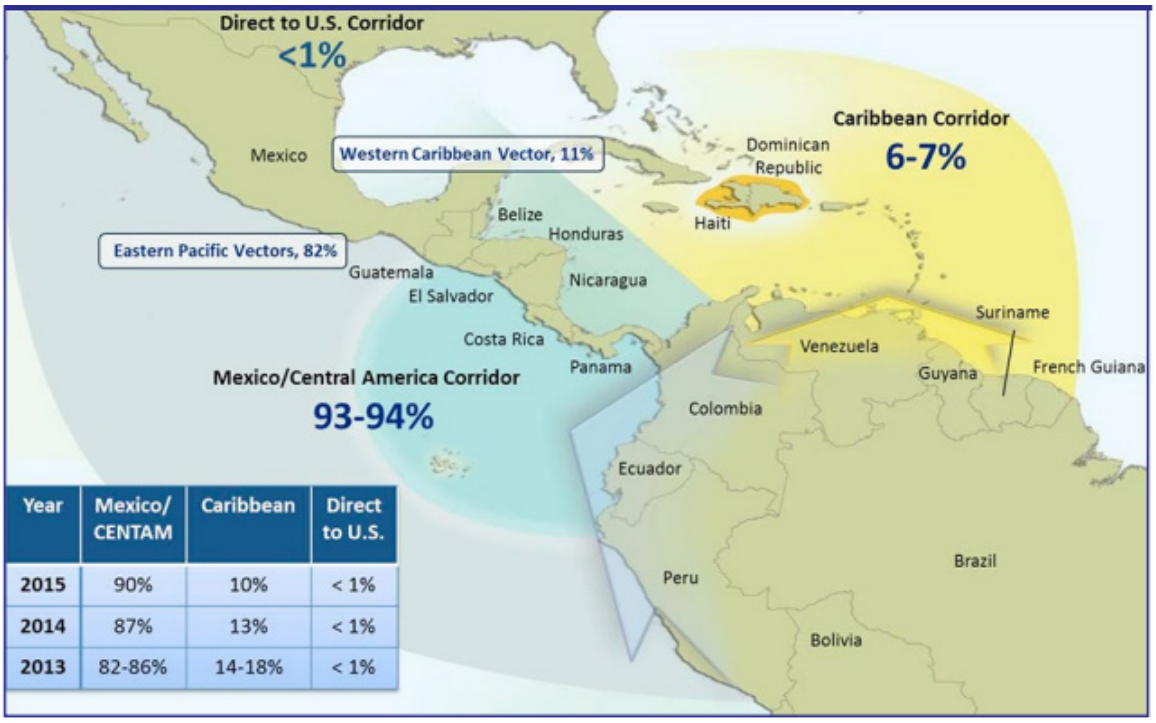

Figure 1. Southern Command drug corridors.[27]

---

[25] William E. Gibson, "Shifting Drug Smuggling Routes Bring Contraband to Florida," *SunSentinel*, April 5, 2014, http://articles.sun-sentinel.com/2014-04-05/news/fl-drug-smuggling-routes-20140404_1_central-florida-south-florida-cocaine-shipments.

[26] Gibson.

[27] Source: United States Department of Justice Drug Enforcement Administration, *2017 National Drug Threat Assessment,* 93.

b. Drug Trafficking Types of Vessels

Depending on drug traffickers' destination and likely routes to take, the vessel type utilized will vary. The most commonly used methods of transportation by drug traffickers are fishing vessels, narco-subs, pangas, and fast-boats. Phillips and Kuhns note that the drug traffickers' method can be "highly tailored" to the drug they are transporting, the distance to their destination, and the load amount, and can vary by different trafficking organizations.[28] For example, Atkinson et al. note that a panga boat, which travels at a lower speed on average compared to a fast-boat, would not be efficient in longer routes like the eastern Pacific corridor because it would take several days to arrive to the destination.[29] Moreover, they state that a narco-sub, which travels at a much lower speed compared to a panga, would be most effective in areas where law enforcement assets are likely to exist compared to a fast-boat because they are below the surface of the water, thus harder to detect and be interdicted.[30] Both sources agree in the changing security environment and the needed adaptation and innovation drug traffickers must consider. Although fishing vessels have been the most effective method of transporting illicit drugs due to the legitimacy of the fishing industry. Matthew S. Mooshegian stated, in his study, that narco-subs are becoming prevalent in the eastern Caribbean and eastern Pacific because of the relatively large amount of drugs they can carry and because of its tactical advantage over the other vessels.[31]

---

[28] Matthew Phillips and Joseph B. Kuhns, "Illicit Drug Trafficking," in *Transnational Crime and Global Security*, ed. Philip L. Reichel and Ryan Randa (Santa Barbara, CA: ABC-CLIO, 2018), 3.

[29] Atkinson, Kress, and Szechtman, "Maritime Transportation of Illegal Drugs from South America," 45.

[30] Atkinson, Kress, and Szechtman.

[31] Matthew S. Mooshegian, "A Probabilistic Model of Illegal Drug Trafficking Operations in the Eastern Pacific and Caribbean Sea," (master's thesis, Naval Postgraduate School, 2013), 7, http://www.dtic.mil/dtic/tr/fulltext/u2/a589558.pdf.

2. State of Maritime Interdiction Operations

a. The Need for More Assets

The key literature that highlights the shortfall in assets is the *2018 United States Southern Command Posture Statement* by Admiral Kurt W. Tidd, Commander, United States Southern Command. Admiral Tidd laid out the changing security environment in the SOUTHCOM area of operations, explaining that more threat networks are appearing and old networks are expanding.[32] A small, violent extremist group has emerged in Latin America, and drug traffickers are increasing their use of the vast open ocean to transport illicit drugs to Central American countries and Mexico. Admiral Tidd has labeled these threat networks as the primary challenge in the area of responsibility, and that in order to meet SOUTHCOM's mission of securing the southern approaches to protect the homeland, more assets are required.[33] Though Admiral Tidd focuses on how to better employ current assets, it is clear that more assets, in general, are required to meet the growing challenge in the area of responsibility. Specific to the maritime domain, in his address to the Senate Armed Services Committee before the 115th Congress in February 2018, Admiral Tidd stated that Joint Interagency Task Force South (JIATF-S) has the intelligence and known locations of suspected vessels carrying illicit drugs but only about 25 percent of those vessels are interdicted.[34] Further, he expressed in his posture statement that in the Eastern Pacific corridor, JIATF-S is only able to respond to 1 out of every 31 drug trafficking events.[35] The importance of surface assets in the drug interdiction mission, and in maritime security in general, is underscored by Admiral Tidd's statement.

---

[32] Posture Statement of Admiral Kurt W. Tidd, Commander, United States Southern Command: Before the 115th Congress Senate Armed Services Committee (2018), 3–4, http://www.southcom.mil/Portals/7/Documents/Posture%20Statements/SOUTHCOM_2018_Posture_Statement_FINAL.PDF?ver=2018-02-15-090330-243.

[33] Tidd, 10.

[34] *2018 Posture Statement*: Testimony Before the Senate Armed Services Committee, 115th Cong. (2018) (testimony of Admiral Kurt W. Tidd, Commander of U.S. Southern Command).

[35] Posture Statement of Admiral Kurt W. Tidd, Commander, United States Southern Command: Before the 115th Congress Senate Armed Services Committee (2018), 10.

b. Reduced Drug Removal Rate

The Review of the *U.S. Coast Guard's Fiscal Year 2017 Drug Control Performance Summary Report* completed by the Office of Inspector General in January 2018 highlights the consequences of having a limited number of surface ships to interdict vessels, and stresses the importance of surface ships in maritime security. The report states that the Coast Guard's performance, measured by cocaine removal rate, did not meet the target.[36] Though other illicit drugs were confiscated, cocaine removal rate was used as a way to measure performance because it measured the Coast Guard's effectiveness in interrupting the flow of cocaine to the homeland.[37] In fact, the Coast Guard has missed its performance target for the last four consecutive years.[38] The report listed several reasons why the Coast Guard missed its target and three of these reasons directly apply to the need for more assets: first, the age and condition of Coast Guard cutter fleet; second, the absence of aviation assets from the Navy; and finally, the absence of surface assets from the Navy.[39] Moreover, despite the Coast Guard increasing their working hours and exceeding deployment target days[40] to support the mission, the result was still negative—the Coast Guard did not meet its goal. The report indicated that the growth in flow of cocaine through the maritime domain underscores the importance of surface assets.

c. Strengthened Partnership with Other Nations

As a way to mitigate the risk of drug traffickers slipping through maritime security because of the lack of surface assets, SOUTHCOM continues to further its positive relationship and collaboration with partner nations in its area of responsibility. Two international meetings have been hosted by the United States—one in December 2017 and the other in January 2018—to collaborate with partner nations regarding maritime security. During the *International Meeting on Maritime Security*, the Commander of the Colombian

---

[36] Office of Inspector General, *2017 Drug Control Performance*.

[37] Office of Inspector General, 3.

[38] Office of Inspector General.

[39] Office of Inspector General, 4.

[40] Office of Inspector General.

Navy and the Mexican Secretary of the Navy joined forces with the Commandant of the U.S. Coast Guard, Commander of U.S. Southern Command, and Commander of U.S. Northern Command to work on a drug interdiction strategy to combat TCOs and disrupt illicit drug shipments.[41] In this meeting, the group signed a letter of intent that stated missions in their area of operations; the United States will patrol and cover international waters while partner nations will assist by covering their territorial waters.[42] Moreover, during Admiral Tidd's Pentagon press briefing in March 2018, he emphasized that the work with partner nations in Latin America and the Caribbean is important in the mission to disrupt and dismantle TCOs.[43] In fact, in his *2018 United States Southern Command Posture Statement*, Admiral Tidd highlighted the significance of maritime security assets from partner nations, mentioning the fact that 77 metric tons of cocaine out of the 283 metric tons confiscated by JIATF-S in fiscal year 2016 would have arrived in the United States if partnership with those countries did not exist.[44] Because there are less United States assets for drug interdiction, it makes sense to collaborate with law enforcement securities from partner nations to continue the drug interdiction mission.

3. Vessel Procurement in the Navy

a. Procurement Process

A review of the *2016 Navy Force Structure Assessment (FSA)* gave the initial process of acquiring assets, specifically surface ships. Asset requirement in a particular area of responsibility starts with an assessment of the missions that must be implemented with the capability of current assets.[45] Combatant Commanders will look at their current

---

41 "U.S. Hosts International Meeting On Maritime Security," U.S. Southern Command, January 19, 2018, http://www.southcom.mil/MEDIA/NEWS-ARTICLES/Article/1420120/us-hosts-international-meeting-on-maritime-security/.

42 U.S. Southern Command.

43 Lisa Ferdinando, "Admiral Highlights Southcom's Strengthened Partnerships," *DoD News*, March 5, 2018, http://www.southcom.mil/MEDIA/NEWS-ARTICLES/Article/1458537/admiral-highlights-southcoms-strengthened-partnerships/.

44 Posture Statement of Admiral Kurt W. Tidd, Commander, United States Southern Command: Before the 115th Congress Senate Armed Services Committee (2018), 15.

45Department of the Navy, *Executive Summary: 2016 Navy Force Structure Assessment (FSA)*, December 14, 2016, 1, https://news.usni.org/wp-content/uploads/2016/12/FSA_Executive-Summary.pdf.

security environment, noting challenges that exist and gaps in security that could be pursued by threats. Additionally, combatant commanders will determine if the assets they currently have is sufficient enough to meet those challenges. The review stated that all Combatant Commands are to submit a ship capabilities requirement based on their analysis of the security environment and asset capability.[46] These submissions will result in the required size of the surface Navy to meet its mission, where Congress will ultimately make a decision to approve, reject, or alter the request.

The key funding document of the Department of the Navy is the *Financial Management Policy Manual,* updated in October 2017, which delineated the structure of government components and appropriations process.[47] Specific to shipbuilding, the policy manual allows the Navy the use the multiple-year appropriations in the procurement of ships and aircraft that must first be approved through legislation in Congress.[48] Funding for shipbuilding comes in three forms: full, incremental, and advanced. In his Congressional Research Service report, *Navy Ship Procurement: Alternative Funding Approaches - Background and Options for Congress*, Ronald O'Rourke states that the principal difference between each of the three types of procurement funding is the timeframe when funding will be authorized. Additionally, specific to the drug interdiction mission, chapter 14 of the *Department of Defense Financial Management Regulation* provides the budget request and instruction for activities related to the drug interdiction and counter-drug mission.[49] Thus, the procurement process is important to understand because it shows who really makes the decision as to ship acquisition and how funding can affect the ship building timeframe.

---

[46] Department of the Navy, 1-2.

[47] Department of the Navy, 1-1-2.

[48] Department of the Navy, *Financial Management Policy Manual*, (Washington, DC: Department of the Navy, 2017), 1–1-2, http://www.secnav.navy.mil/fmc/Documents/FINAL-Financial-Management-Policy-Manual-FMPM.pdf.

[49] Under Secretary of Defense, *Department of Defense Financial Management Regulation - Volume 2B: Budget Formulation and Presentation (Chapters 4–19)*, DoD 7000.14-R (Washington, DC: Department of Defense, 2017), chap. 14, http://comptroller.defense.gov/Portals/45/documents/fmr/Volume_02b.pdf.

b. Quality of Procurement

Although conceptually the FSA can be easily understood, several factors exist that can possibly hinder a request by certain Commanders over others. Combatant Commanders submit a request for more assets, and Congress approves the request. For example, based on the review of the FSA, the required number of ships totaled 653, which basically doubles the current force of the Navy.[50] Budget constraints is the factor that makes this unacceptable. Moreover, the security environment and capability assessment could lead decision makers to support European Command requests over Southern Command, for example. The final FSA brought the 653 number of ships required down to 355, where no additional change in small surface combatants (frigate- or cutter-type vessels for drug interdiction) from 2014 to 2016.[51] This means that other types of vessels—carriers, submarines, and destroyers—were increased but there was no additional ship for the drug interdiction mission. Moreover, in Admiral Tidd's testimony before Congress, he was clear that budget constraints has a negative effect on SOUTHCOM's ability to implement the mission.[52]

D. RESEARCH DESIGN

The research design will assess the nature of two components: first, this thesis will conduct an evaluation on the Navy's maritime interdiction strategy and actions; and second, this thesis will conduct a technological assessment of the Navy's newly acquired MK VI patrol boat. Then, this thesis will determine if the technology is adequate and suitable for the policy.

The policy analysis will be conducted using Bardach's Eightfold Path model: "define the problem, assemble some evidence, construct the alternatives, select the criteria,

---

[50] Department of the Navy, *Executive Summary: 2016 Navy Force Structure Assessment (FSA)* (December 14, 2016), 3.

[51] Department of the Navy.

[52] Tidd, testimony on 2018 Posture Statement.

project the outcomes, confront the trade-offs, decide, and tell the story."[53] First, the problem will be established by reviewing the current maritime drug interdiction policy as it applies to operations of present-day drug traffickers. Second, the evidence to support the problem will be gathered from the issues that current assets encounter while conducting maritime drug interdiction operations. Third, based on the problem and evidence posed, the analysis will attempt to construct an alternative option for maritime assets that might be effective. A matrix will be constructed with one axis labeled with the various maritime vessels drug traffickers use and the other axis labeled with the various interdiction assets used by maritime law enforcement. This matrix will assist in defining the criteria needed for analysis. Finally, an analysis of the matrix will present possible outcomes as well as possible trade-offs.

Since the Navy's newly acquired MK VI patrol boats are built with significant technology improvements, the method of analysis will be one of technology assessment. This method will be conducted using Braun's five-step Scope-Technology-Impact-Policy (STIP) model,[54] which asks structured questions beginning with the determination of the problem and ends with the possibility of policy formation. This approach is appropriate for the research question because an evaluation of the MK VI's installed technologies, combined with the capability vulnerabilities of current technology, would give an understanding on how the MK VI can contribute to the drug interdiction mission and maritime security. The objective of this approach is to determine the MK VI's technology "opportunities, possibilities, and ramifications" for the Navy and the environment in which it will operate in.[55] The goal is to assist in the decision-making process and to provide decision-makers an alternative option better suited for the mission.

Finally, after conducting the strategy analysis and technology assessment, the suitability will be evaluated to determine where the current maritime interdiction strategy

---

[53] Eugene Bardach and Eric M. Patashnik, *A Practical Guide for Policy Analysis: The Eightfold Path to More Effective Problem Solving*, 5th ed. (Thousand Oaks, CA: CQ Press, 2016).

[54] Ernest Braun, *Technology in Context: Technology Assessment for Managers* (New York: Routledge, 2005), http://erl.ucc.edu.gh:8080/jspui/bitstream/123456789/2997/1/%5BErnest_Braun%5D_Technology_in_Context_Technology_A%28BookZZ.org%29.pdf.

[55] Braun.

and the MK VI technology fit together and where they do not, and perhaps, provide an effective recommendation to support the drug interdiction mission.

E. THESIS OVERVIEW

This thesis is structured into five chapters. The first chapter has established the research question, the significance, and the design on how to approach the problem. The second chapter analyzes the drug interdiction strategy utilizing the Eightfold Path model. The third chapter assesses the technology of the MK VI patrol boat using the STIP model. The fourth chapter analyzes a criteria matrix contrasted against two operational environments to determine whether the MK VI's technology is a fit for the maritime drug interdiction strategy. The fourth chapter presents the recommendations, and finally, the fifth chapter provides the conclusion.

II. UNITED STATES MARITIME DRUG INTERDICTION

Various United States government agencies place a high priority on stopping illicit narcotics from entering the homeland. Because of the dynamic maritime threat, these government agencies implement various strategies to secure the maritime domain from illegal activities. Figure 2 shows the flow of maritime security strategies and policies from the presidential level down to the armed services on the frontlines—the Navy and the Coast Guard. Although many government agencies (CBP, DEA, FBI, etc.) and partner nations are involved in policing the maritime domain, each with their respective maritime strategies and policies, the focus of this section is the Navy's strategy and actions because the Navy plays a vital role in patrolling areas beyond the U.S. territorial waters—the high seas. Other governmental policies and strategies are highlighted because of their importance in the development of Navy strategies and policies.

Figure 2. Maritime security strategies.

A. NAVY'S MARITIME SECURITY STRATEGIES

1. A Cooperative Strategy for 21st Century Seapower

This strategy states the growing military capabilities of adversaries and highlights the fundamental approach and mindset that the sea services (the Navy, the Coast Guard, and the Marines) should have. A vital action to a growing dynamic threat is jointness from armed service, government agencies, and partner nations. Specific to the Western Hemisphere, this strategy emphasizes the jointness approach of JIATF-S in tackling the maritime drug trafficking problem. Moreover, strong partnerships with other nations in the area of responsibility are strategic goals that will ensure a tough maritime security posture to deter drug traffickers. Central and South American nations participate in SOUTHCOM exercises in order to build capacity and strengthen interoperability.

One path in addressing the growing maritime threat in the Western Hemisphere is to build SOUTHCOM's deterrence capability. Deterrence can come in many forms; however, in the maritime domain interdiction assets are the capabilities required to stop a drug shipment from moving freely in the vast transit zone and prevent them from reaching their destination uninterrupted. To interrupt the drug shipment link, two things must be achieved: continuous presence and continuous support.

First, maritime assets must continuously remain present in the region. Without question, drug trafficking organizations use maritime conveyances to transport their illicit products. JIATF-S conducts regular patrol of the maritime domain in SOUTHCOM and regularly returns with seized drugs from maritime drug traffickers. Because drug trafficking organizations will continue to use all available means to transport and deliver their illicit products to their market, it is vital to the mission to maintain interdiction assets in the transit zone to continuously interrupt and break the link between the drug source and market.

Second, in addition to interdiction assets remaining present in the transit zone, DoD must continue to provide assets to accomplish the mission. The transit zone remains a big area to monitor with only a few maritime and air assets. The interdiction assets currently present in the transit zone cannot capture the entire common operational picture of the

region because it is simply too massive; operators of interdiction assets would focus on a specific area within the transit zone and leave other suspected areas to other maritime assets—if they are available. In other words, drug traffickers use the vastness of the transit zone to their advantage, often altering drug shipment routes to avoid detection. Because of the importance of the mission to national security, DoD must continue to procure, build, and add to the maritime interdiction fleet. This fleet needs to significantly grow in numbers to achieve higher interdiction rate and to actually interrupt and destroy the use of maritime conveyances by drug trafficking organizations.

This strategy, however, lays out that budget constraints and restraints exist; therefore, risk and prioritization must be analyzed and assessed. It is no secret that maritime threats exist in this region and the sea services will need to be better prepared to counter the adversaries.

2. Naval Operations Concept

The *2010 Naval Operations Concept* implements the six core capabilities presented in *A Cooperative Strategy for 21st Century Seapower* "sea control, deterrence, forward presence, power projection, maritime security, and humanitarian assistance and disaster response."[56] The purpose of this publication is to "describe when, where and how" the naval services—the Navy, the Coast Guard, and the Marine Corps—will employ its capabilities to ensure the security of the maritime domain.[57] Threats in the maritime domain, both state actors and non-state actors, are increasing and these threats matter because it represents a problem for the naval services. The maritime domain is the "maneuver space"[58] required by the naval services to do their mission. With this existing dynamic security environment, maritime assets must have access to the full maritime domain to employ its full range of joint military operations. Although not a prescription for required actions, this publication highlights the criticality of what each of the naval

---

[56] U.S. Navy, U.S. Marine Corps, U.S. Coast Guard, *Naval Operations Concept 2010: Implementing the Maritime Strategy* (Washington, DC: 2010), 3, http://www.navy.mil/maritime/MaritimeStrategy.pdf.

[57] U.S. Navy, U.S. Marine Corps, U.S. Coast Guard, 1.

[58] U.S. Navy, U.S. Marine Corps, U.S. Coast Guard, 14.

services brings to the table in terms of capabilities and emphasizes the concept of operating jointly in a hostile environment.

Maritime security represents the key core capability pertaining to the Navy's involvement in the maritime counterdrug mission, especially in the Western Hemisphere. The naval service plays a vital role in this approach because its assets are trained, equipped, and manned, enabling better assistance to other non-military agencies and partner nations. The Navy's contribution to maritime security are the ships it deploys to enforce international law and safeguard the maritime domain. As stated in *A Cooperative Strategy for 21st Century Seapower*, "Coast Guard and Navy ships and aircraft are the forward edge of the Nation's layered defense, developing maritime domain awareness, establishing effective maritime governance, and protecting the homeland."[59]

Because of the dynamic maritime threat, the central idea to counter transnational criminal organizations' maritime illicit activities is the integration of efforts of "governments, the private sector, maritime security forces, law enforcement agencies, customs and immigration officials, masters of vessels and other merchant mariners, shipping companies, and port operators."[60] Threats continue to innovate and adapt in their changing security environment; therefore, so must the agencies tasked with preventing those illicit activities. Each nation is solely responsible for all activities in their territorial waters; however, as *A Cooperative Strategy for 21st Century Seapower* states, "Because all nations share in the collective benefits of maritime security [both in territorial and international waters], it is a promising area for expanded cooperation with our allies and partners."[61] Naval services must adapt to work together to counter transnational criminal organizations' maritime illicit activities.

---

[59] U.S. Navy, U.S. Marine Corps, U.S. Coast Guard, *A Cooperative Strategy for 21st Century Seapower* (Washington, DC: Department of Defense, March 2015).

[60] U.S. Navy, U.S. Marine Corps, U.S. Coast Guard, *Naval Operations Concept 2010: Implementing the Maritime Strategy*, 36.

[61] U.S. Navy, U.S. Marine Corps, U.S. Coast Guard, *A Cooperative Strategy for 21st Century Seapower,* 26.

By sharing information needed to conduct operations and having the full operating picture of the maritime domain, this increased cooperation would allow all nations involved in protecting the maritime commons to maximize their interdiction effort. Significantly, this strategy lays out the Navy's responses to threats and addresses the key roles surface ships play in maritime security operations, such as detection and monitoring, and law enforcement operations with an embarked Coast Guard law enforcement detachment team to execute Title 14 authority.[62] For example, because Navy ships do not have law enforcement authority at sea—in terms of interdicting and arresting maritime drug traffickers—when they cooperate with the Coast Guard by having a team onboard to make the arrest, Navy ships now become a full instrument of the counterdrug mission. Not only would Navy ships be detecting and monitoring potential targets, they would also be capable of interdicting and arresting drug traffickers.

B. THE NAVY'S COUNTERDRUG STRATEGY AND ACTIONS

The DoD's primary role is to "[B]e prepared to defend the homeland, remain the preeminent military power in the world, ensure the balances of power remain in our favor, and advance an international order that is most conducive to our security and prosperity" in support of the President of the United States' *National Security Strategy*.[63] Although not its primary mission, the Navy conducts counterdrug operations and assists the Coast Guard in eliminating illicit drug traffickers in the high seas. However, *U.S. Code Title 10* specifically allows the military to cooperate jointly with civilians and law enforcement officials and support the counterdrug and counter-TOC missions.[64] In fact, the DoD is the lead agency for "the detection and monitoring of aerial and maritime transit of illegal drugs

---

[62] U.S. Navy, U.S. Marine Corps, U.S. Coast Guard, Naval Operations Concept 2010: Implementing the Maritime Strategy, 42–43.

[63] Department of Defense, *Summary of the 2018 National Defense Strategy of the United States of America*, (Washington, DC: Department of Defense, 2017), 4, https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf.

[64] Armed Forces, 10 USC § 124 (2011), https://www.gpo.gov/fdsys/pkg/USCODE-2016-title10/pdf/USCODE-2016-title10-subtitleA-partI-chap15.pdf.

into the United States"[65] and it uses Navy ships and aircrafts for these activities. Because of its location, capabilities, and assets, the Navy's 4th Fleet serves as the DoD's maritime component in the counterdrug mission; however, 3rd Fleet provided ships in the past to assist in counterdrug operations in the Eastern Pacific corridor.

Figure 3 displays the detection and monitoring section of the drug interdiction cycle where Navy assets participate and operate. Since its re-establishment in 2008 and headquartered in Mayport, Florida, U.S. 4th Fleet oversees Navy assets provided by U.S. Fleet Forces (previously known as U.S. 2nd Fleet) and U.S. 3rd Fleet. While Navy assets—mainly ships—are deployed in the SOUTHCOM area of responsibility, they cooperate with JIATF-S for detecting and monitoring suspected vessels carrying illicit drugs. In most cases, Navy ships participate in the next step of the cycle, which is the interdiction of suspected vessel, as long as a law enforcement detachment team is embarked because they handle the arrest in the law enforcement side.

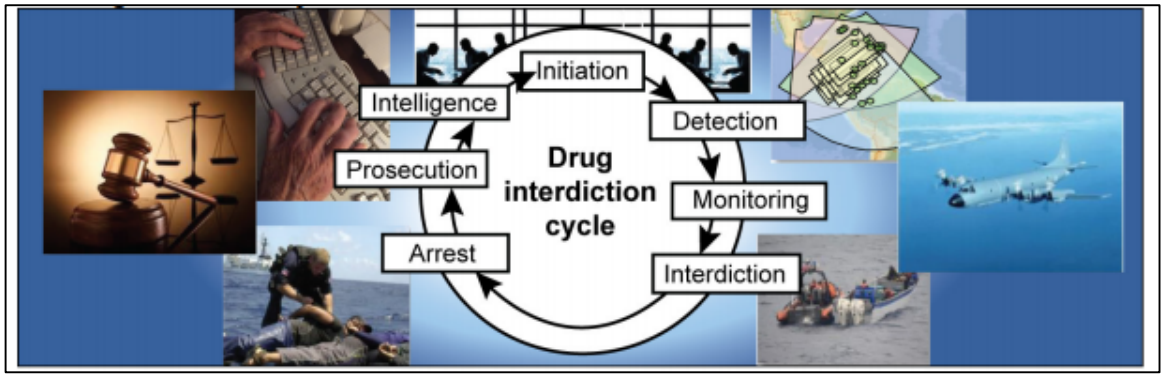

Figure 3. The maritime and aerial drug interdiction cycle.[66]

[65] Armed Forces, 10 USC § 124 (2011), https://www.gpo.gov/fdsys/pkg/USCODE-2010- title10/pdf/USCODE-2010-title10-subtitleA-partI-chap3-sec124.pdf.

[66] Source: U.S. Government Accountability Office, *Overview of U.S. Efforts in the Western Hemisphere*, GAO-18-10 (Washington, DC: Government Accountability Office, 2017).

A report from October 2017 publicized a Navy counterdrug operation that resulted in a successful drug interdiction in SOUTHCOM. With an embarked law enforcement detachment team, USS Zephyr (a 179-foot PC/coastal patrol ship) detected, monitored, and interdicted a go-fast boat in the Caribbean Sea carrying bales cocaine worth $17–26 million.[67] Moreover, several Fleet Forces and 3rd Fleet Navy ships—most notably the OHP class frigates—deployed to the 4th Fleet area of responsibility between 2008 and 2015 have successfully interdicted and removed vessels carrying illicit drugs bound for the homeland. Thus, the Navy continues to implement the statute and support other USG agencies' counterdrug operations using Navy ships.

C. COUNTERDRUG STRATEGY AND ACTIONS ANALYSIS

Using components from Bardach's Eightfold-Path model, this section will analyze the Navy's strategy and actions to detect, monitor, and interdict suspected vessels; specifically, identifying the key problem and the evidence that supports it.

1. Problem

A key problem in the Navy's strategy and actions is that OHP-class frigates allocated to SOUTHCOM for the counterdrug mission were all decommissioned in 2015 without an immediate, permanent replacement. These vessels were important because they provided the capabilities that the counterdrug mission needed, mainly that they have a flight deck capable of carrying helicopters, and big enough to carry a law enforcement team, such as the Coast Guard's law enforcement detachment team. Similar to Coast Guard cutters, the frigates possessed the speed and endurance fit for counterdrug operations.

Navy frigates—and Coast Guard cutters—primarily operated in the high seas since the end of the Cold War, and their complete removal from the inventory in 2015 placed an enormous responsibility on, and overloaded, Coast Guard cutters in the high seas. In other words, to view the issue in terms of Bardach's "deficit and excess," there are not enough

67 "USS Zephyr Conducts Counternarcotics Operations," U.S. Southern Command, November 13, 2017, http://www.southcom.mil/MEDIA/NEWS-ARTICLES/Article/1370250/uss-zephyr-conducts-counternarcotics-operations/.

maritime security assets in the high seas to conduct counterdrug interdiction missions. This is an important problem because the Navy is the DoD's maritime component in its lead role to detect and monitor maritime drug trafficking, and also because funding is still provided by the U.S. government to DoD to accomplish its counterdrug strategic goal as stated in the *Counternarcotics and Global Threats Strategy*.

So, the question is, How does a Navy numbered fleet commander contribute to the success of its maritime mission in its area of responsibility to counter illicit drugs headed for the homeland without maritime assets? To note, 4th Fleet does not actually own Navy ships that it can allocate to fill the frigates' roles while the DON figures out an immediate, permanent replacement.

2. The Evidence

Two variables are at play in the problem presented: first is the number of maritime assets TCOs deploy to transport drugs, and second, is the number of maritime assets the U.S. government currently deploy for counterdrug operations. This section will compare the two variables and explain current activities and trends.

a. TCO Drug Fleet

What is known about the adversaries' maritime drug fleet is that certain types of vessels are used as their modes of transportation. As explained by Phillips and Kuhns, "The most common platforms for maritime drug smuggling are fishing vessels, commercial cargo ships, and small...go-fast boats."[68] However, drug traffickers are adapting to the changing security environment and have started to increase the use of narco-submarines, which are platforms that can either travel low at the surface or completely submerged, to avoid detection by law enforcement.[69] Additionally, a White House report stated that "go-fast boats were the primary conveyance traffickers used in both Mexico/Central America

---

[68] Phillips and Kuhns, "Illicit Drug Trafficking," 10.

[69] Christopher Woody, "The Coast Guard Is Increasingly Facing A Stealthy New Breed Of Drug Smuggler," *Task & Purpose*, September 20, 2017, https://taskandpurpose.com/coast-guard-narco-submarine-drugs.

and the Caribbean."[70] These reports provide information on what the adversary has in their inventory and which platform is mostly used but they do not provide the adversary's drug fleet size. However, a model from a 2017 study and drug seizure trends from counterdrug agencies can provide a general estimation.

To get an estimation of the size of the adversaries' drug fleets, the study conducted by Atkinson et al. provides information. Based on public information and UNODC reports, the study found that an estimate of between four to six dozens of drug shipments occur every month and that two to four drug vessels—go-fast, semi-submersible, fishing, or panga—are on the high seas at any given time.[71] This result was extrapolated based on the carrying capacity of each of the drug vessels, the maximum speed of those vessels, and the amount of cocaine that flowed through the transit zone, which the UNODC reported as 850 metric tons in 2011. In comparison, if the same model is applied to previous years' flow of cocaine, the estimation of drug shipments and the number of drug vessels in the high seas would increase substantially. Table 1 presents the flow of cocaine extracted from the Consolidated Counter Drug Database (abbreviated as "database" hereafter), which counterdrug agencies—such as the Coast Guard—use as source information for drug movements.

Table 1. Cocaine flow through the transit zone in metric tons.[72]

Fiscal Year:	2014	2015	2016	2017
Flow:	945	1,254	2,834	2,738

[70] Office of National Drug Control Policy, *Global Cocaine Trafficking* (Washington, DC: The White House, 2017), https://www.whitehouse.gov/sites/whitehouse.gov/files/ondcp/global_cocaine_trafficking.pdf

[71] Atkinson, Kress, and Szechtman, "Maritime Transportation of Illegal Drugs from South America," 48–9.

[72] Office of Inspector General, *2017 Drug Control Performance*, 3.

The observed trend reported in the database is that the amount of cocaine—or flow—in the transit zone leaving South America has steadily increased. In fact, cocaine flow in FY 2017 has more than tripled the amount of cocaine flow in FY 2011. Therefore, based on the model presented by Atkinson et al. and using 2017 data of 2,738 metric tons of cocaine, the result would be an estimated monthly adversary size of 12 to 24 dozen. In other words, there would be a minimum of 144 and a maximum of 288 drug shipments occurring every month, and 6 to 12 drug vessels on the high seas at any given period. In relative terms, if 288 drug shipments per month holds true, then the adversary's fleet size would be larger than the total of the Navy's deployable ships—282.[73]

Moreover, the size of coca bush cultivation in Colombia can be seen as a significant trend because, the greater the size, the greater the supply of cocaine. Colombia is highlighted because it remains the largest cocaine producing country in the Western Hemisphere with North America being the largest consumer.[74] In fact, "92 percent of cocaine trafficked to the United States originate from Colombia."[75] Figure 4 shows the increasing trend in coca bush cultivation in Colombia beginning in 2013. Reported at 146,000 hectares of coca cultivated land, Colombia has tripled its cocaine land area, which essentially tripled its supply. More supply means more finished product available for transport, which means more shipment activities would occur. This trend is directly aligned with the increase in maritime seizure of cocaine reported by the Coast Guard.

---

[73] "Status of the Navy," U.S. Navy, accessed August 17, 2018, http://www.navy.mil/navydata/nav_legacy.asp?id=146.

[74] United Nations Office on Drugs and Crime, *World Drug Report 2017: Booklet 3 - Market Analysis of Plant-Based Drugs - Opiates, Cocaine, Cannabis*, 28.

[75] United Nations Office on Drugs and Crime, *World Drug Report 2018: Booklet 3 - Market Analysis of Plant-Based Drugs - Opiates, Cocaine, Cannabis*, (Vienna, Austria: United Nations Office on Drugs and Crime, 2018) 32, https://www.unodc.org/wdr2018/prelaunch/WDR18_Booklet_3_DRUG_MARKETS.pdf.

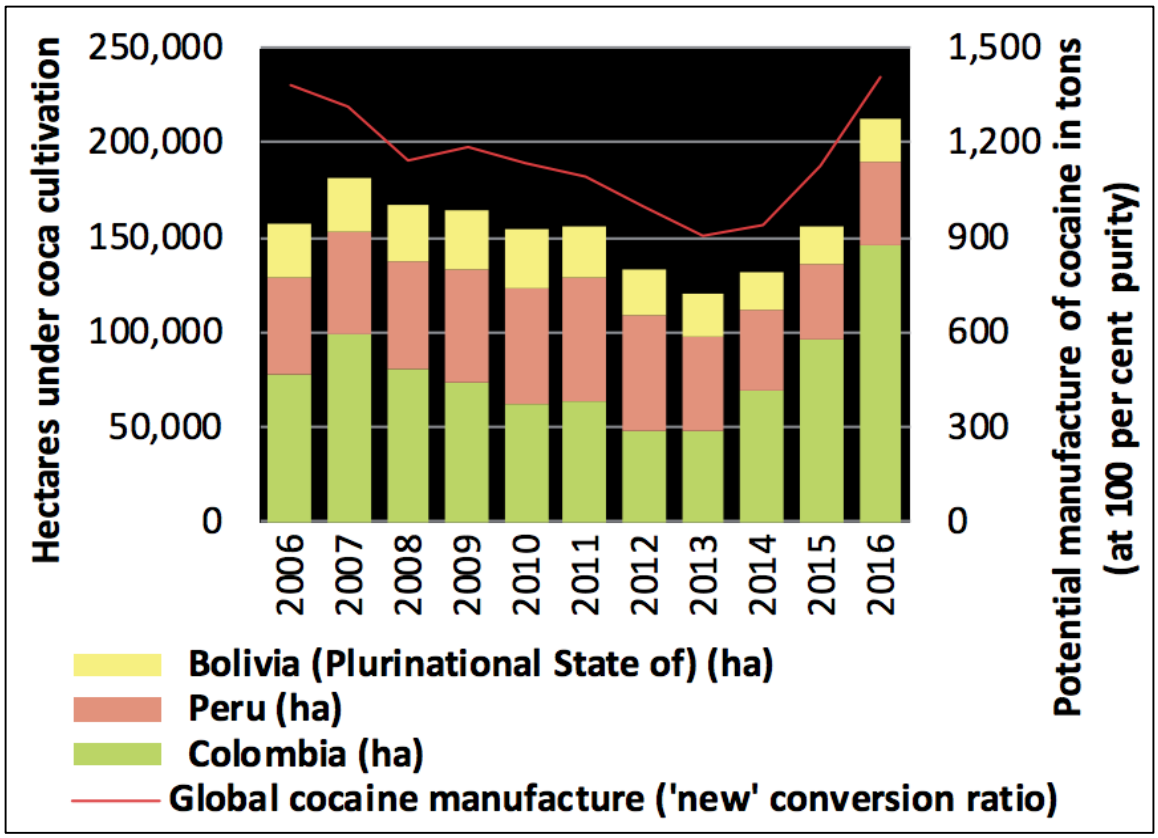

Figure 4. Global coca cultivation and coca manufacture, 2006–2016.[76]

b. U.S. Counterdrug Fleet

Estimation of how to structure a U.S. counterdrug fleet can be measured in terms of trends and reports by high officials. Figure 5 points out two things that assist the quantification of the problem: illicit drug movements and the counter drug performance report of JIATF-S. First, JIATF-S reported a general increase in the number of illicit drug activities in the transit zone, especially between 2013 and 2017. Significantly, the increase in drug events were associated with a decrease in counterdrug maritime assets in the same time period. Beginning in 2010, the Navy started to remove the frigates from its asset list, and by late 2015, all frigates were decommissioned. Although no correlation exists between the increase in drug events and the decrease in interdiction assets, the data shows

[76] Source: United Nations Office on Drugs and Crime, 31.

that Navy strategy and actions are in conflict with reality; there are less Navy maritime assets in an environment that requires more.

Second, the DoD's *FY 2017 Performance Summary Report* showed a general steady trend, between 70 and 80 percent from 2013 to 2017 (see blue line in Figure 5), of successful target hand-off to interdiction assets. Navy maritime assets would get intelligence of possible drug events where assets would deploy to detect and monitor those events. The success comes in the part of detecting the target vessel and transferring, or "handing off," control to an interdicting law enforcement asset, such as Coast Guard cutters or one from a partner nation. However, further analysis of the data reveals an underlying problem. For example, in FY 2017, JIATF-S had strong and validated intelligence on 4,251 drug movement events—where "conveyance, location, drug type, date and time" were known—but only 1,071 events could be acted on.[77] In other words, 3,180 drug events went uninterrupted; those drug traffickers were free to maneuver from point of origin to destination to deliver illicit drugs. The data results in only a 25 percent success rate and is "primarily due to the lack of allocated air and maritime resources."[78] Although hand-off success rate is reported at around 70–80 percent, the actual interdiction of maritime drug movements remains at around 20–30 percent for the past five years (see orange line in Figure 5).

---

[77] Inspector General U.S. Department of Defense, *Independent Auditor's Report On The FY 2017 DoD Performance Summary Report for the Funds Obligated for National Drug Control Program Activities*, Report No. DODIG-2018-066 (Alexandria, VA: Department of Defense, 2018), https://media.defense.gov/2018/Feb/02/2001873207/-1/-1/1/DODIG-2018-066.PDF.

[78] Inspector General U.S. Department of Defense, 13.

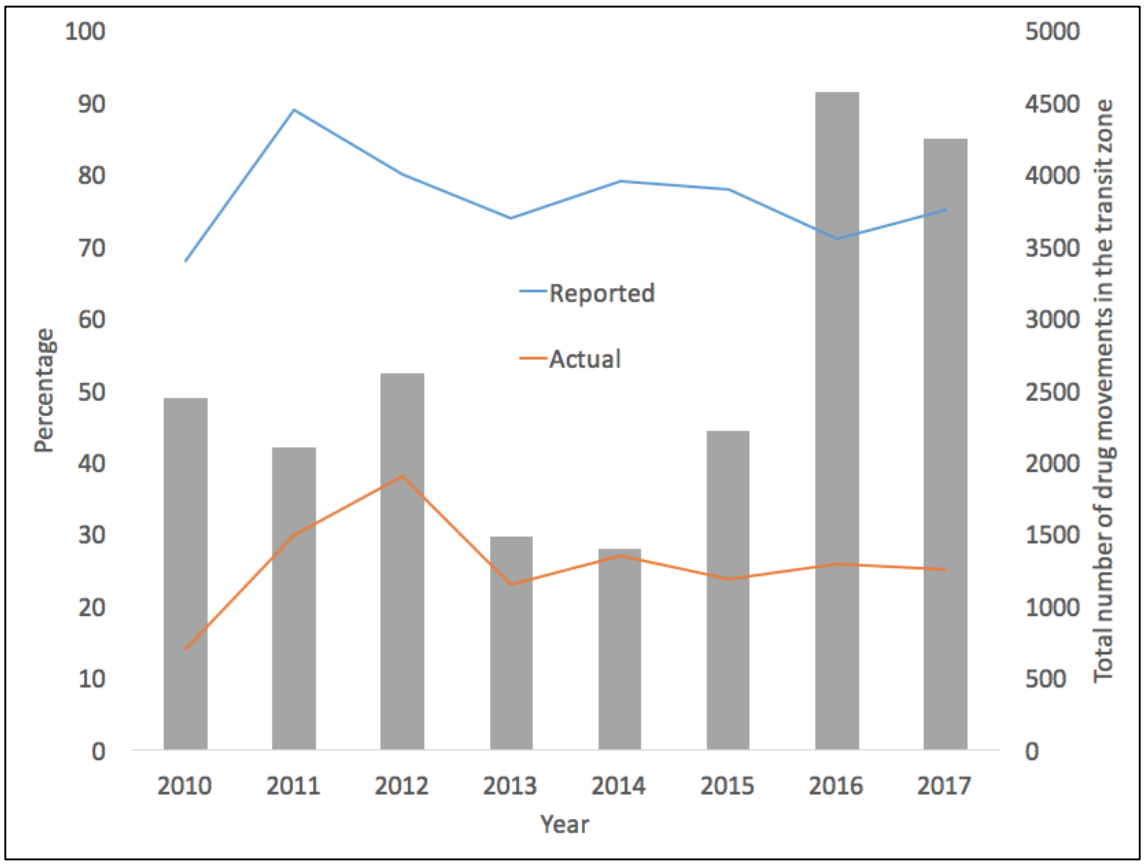

Figure 5. Total number of illicit drug movements in the transit zone versus percentage of successful interdiction efforts.[79]

In addition to the evidence presented above, in his *2018 Southern Command Posture Statement,* Admiral Tidd stressed to the Senate Armed Services Committee the importance of maritime assets and the limitations of their interdiction capabilities. Admiral Tidd stated,

> We have a pretty good situational awareness on an awful lot of the traffic that is—trafficking that is occurring. And that is based on very close partnership with a variety of countries in the region, most notably, with Colombia. [However], of the known tracks that we are aware of—and we

[79] Data representing the blue line and gray bars adapted from Inspector General U.S. Department of Defense, *Independent Auditor's Report on the FY 2017 DoD Performance Summary Report for the Funds Obligated for National Drug Control Program Activities*, 12.

> think we have got a pretty good handle—we are only able to intercept about 25 percent, about one quarter.[80]

Admiral Tidd further added that because of the asset shortage, JIATF-S interdiction efforts have been to "rely heavily" on partner nations, specifically, "Canada, Central America, Colombia, Mexico, the Netherlands, the United Kingdom, and France."[81] Moreover, JIATF-S's available assets in the Eastern Pacific corridor are over-matched by the amount of drug trafficking events. In fact, only 1 out of 31 drug trafficking events was successfully interdicted in FY 2017.[82] One Coast Guard cutter for every four drug trafficking vessels will not accomplish the mission; this simply is a major shortage in maritime interdiction assets.

c. The Comparison

Deputy Commandant Vice Admiral Charles Ray, during a Senate hearing on International Narcotics Control, stated the best explanation for comparing the adversary's fleet size versus the United States' counterdrug assets. Vice Admiral Ray concluded that "On any given day we will have between six to ten Coast Guard cutters down here [the transit zone] and if you imagine placing that on the United States it is capacity challenge."[83] The United States' exclusive economic zone is about "3.4 million square nautical miles" with roughly 13,000 miles of coastline, which is larger than all 50 states combined.[84] To detect, monitor, and interdict drug vessels in such a huge area with a limited number of assets is an insurmountable task. Maritime assets may be successful in those interdicted vessels; however, those successful events are just a dent in the total drug

---

[80] Tidd, testimony on 2018 Posture Statement.

[81] Posture Statement of Admiral Kurt W. Tidd, Commander, United States Southern Command: Before the 115th Congress Senate Armed Services Committee (2018), 15.

[82] Posture Statement, 15.

[83] "*Adapting U.S. Counternarcotics Efforts in Colombia*": Testimony Before the Caucus on International Narcotics Control, United States Senate (2017) (testimony of Vice Admiral Charles W. Ray, Deputy Commandant for Operations, United States Coast Guard).

[84] "The United States Is an Ocean Nation," National Oceanic and Atmospheric Administration, August 17, 2018, https://www.gc.noaa.gov/documents/2011/012711_gcil_maritime_eez_map.pdf.

shipment occurring in the region; interdiction of one in four events is not mission accomplished.

D. CONCLUSION

Thus, a mismatch exists between strategic decisions and reality. The observed trend was coca cultivation and drug shipments out of Colombia have increased while maritime assets with the mission to stop those drug shipments from reaching the homeland have decreased. One of the missions mandated when 4th Fleet was reestablished is counterdrug operations. However, when the OHP frigates were all decommissioned by 2015, no replacement was provided but yet the mission still exist. With the limited number of assets in the counterdrug fleet, 75 percent of maritime drug events will continue to escape through security gaps. It is unclear whether the counterdrug mission is still prioritized or 4th Fleet does not need a vessel designed for the mission. On the other hand, ships from other fleets are sometimes provided to SOUTHCOM to assist in counterdrug operations, or SOUTHCOM sometimes take advantage of passing Navy ships and use them momentarily for counterdrug operations. Perhaps the mission may need to be re-prioritized, which would then reinforce the need for a specific, dynamic, and adaptive platform for the mission.

THIS PAGE INTENTIONALLY LEFT BLANK

III. TECHNOLOGY ASSESSMENT OF THE U.S. NAVY'S MK VI PATROL BOAT

A. CURRENT TECHNOLOGY

1. Coast Guard Cutters

The Coast Guard currently employs several types of both maritime and aerial assets to accomplish its mandated eleven missions, one of which is drug interdiction. Major Coast Guard cutters—vessels over 200 feet in length—are essentially the vessels that the Coast Guard deploys on the high seas to counter drug trafficking. Table 2 lists the specifications for the three major cutters that conduct counterdrug missions. However, this section will focus on the technology and capability of the Medium Endurance Cutter because this vessel class is the primary instrument the Coast Guard uses for maritime law enforcement and counterdrug mission.[85]

Table 2. United States Coast Guard cutter specifications.[86]

	National Security Cutter (NSC)	High Endurance Cutter (WHEC)	Medium Endurance Cutter (WMEC)
Length	418 ft	378 ft	270 ft
Beam	54 ft	43 ft	38 ft
Displacement	4,500 tons	3,340 tons	1,820 tons
Power Plant	Combined diesel and gas (CODAG); one 30,565 SHP gas turbine engine and two 9,655 HP diesel engines	Two diesel engines 3,500 bhp each; two gas turbine engines 18,000 shp each; two shafts 36,000 shp	Two 3,650 hp V-18 Alco diesel engines; two shafts
Speed	up to 28 kts	up to 29 kts	20 kts
Range	12,000 nm	2,400 nm at 29 kts or 9,600 nm at 19 kts (on gas turbines); 12,000 nm at 14 kts (on diesels)	Just under 3, 800 nm at 19.5 kts; 9,900 nm at 12 kts
Armament	Mk. 110 57 mm gun; Phalanx 20 mm close-in weapon system; Mk. 53 decoy launching system (NULKA); and four M2 .50-caliber machine guns	One Mk. 75 76 mm gun; two Mk. 38 25 mm guns; one Phalanx CIWS; two .50-caliber machine guns; two SRBOC launchers	One Mk. 75 76 mm gun; two .50-caliber maching guns; two SRBOC launchers

85 "The Cutters, Boats, and Aircraft of the U.S. Coast Guard," U.S. Coast Guard, 2016, http://www.overview.uscg.mil/Portals/6/Documents/PDF/CG_Cutters-Boats-Aircraft_2015-2016_edition.pdf?ver=2016-10-19-153700-540.

86 Adapted from "The Cutters, Boats, and Aircraft of the U.S. Coast Guard," U.S. Coast Guard, 130–135.

2. Medium Endurance Cutter

There are two different classes of medium endurance cutter: the Famous class and the Reliance class. Both classes of cutters are heavily involved and used in the high seas to interrupt the maritime transportation link of drug trafficking organizations by seizing illicit cargoes and arresting drug traffickers in the high seas. It is important to note that because both classes are way past their life expectancy of 50 years, they are in the process of being replaced by a new class of cutter—the Offshore Patrol Cutter.[87] However, despite its age, some of these cutters were modernized with better technologies to fit the current dynamic threat. In August 2017, there were 28 operational medium endurance cutters.[88]

When all-source intelligence at JIATF-S points to a possible drug shipment or on-going drug activity at sea, medium endurance cutters are deployed to the location to detect and monitor the drug vessel. Ships sent to the location would usually be naval vessels but Coast Guard cutters are used as well. Figure 6 depicts a generic list of capability and technology that the medium endurance cutters carry.

[87] Government Accountability Office, *Improved Acquisition Portfolio Management Could Help Address Aging Assets and Capability Gaps*, GAO-18-629T (Washington, DC: Government Accountability Office, 2018), 14.

[88] U.S. Coast Guard, *Component Overview*.

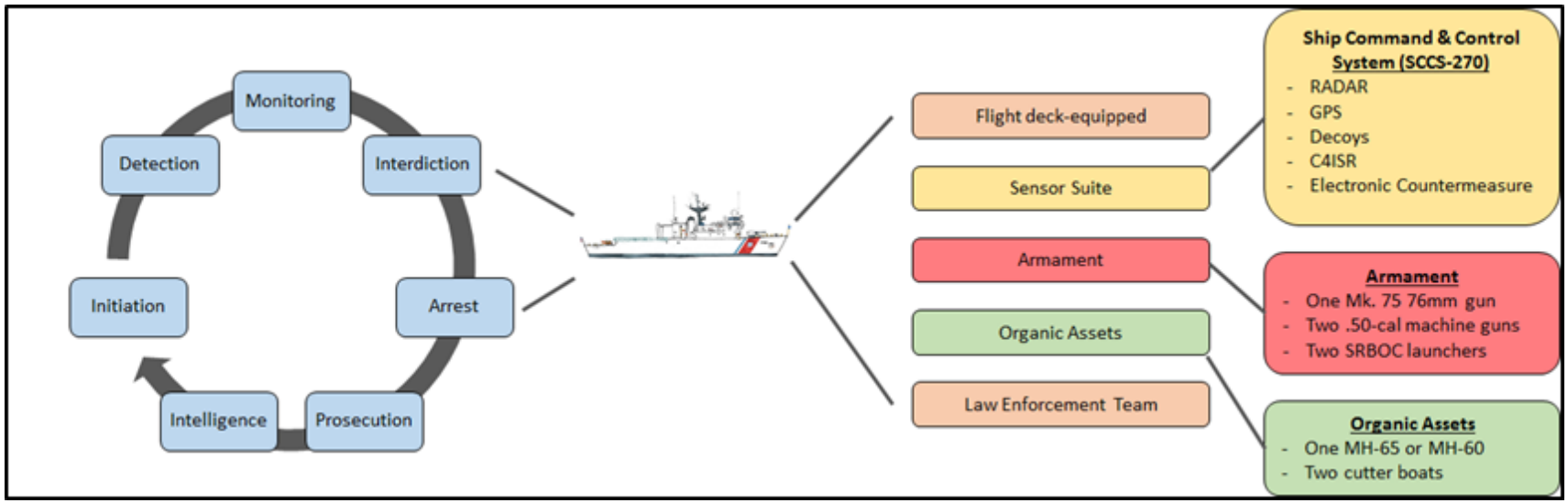

Figure 6. Medium Endurance Cutter technology and capabilities.[89]

[89] Source: U.S. Government Accountability Office, *Overview of U.S. Efforts in the Western Hemisphere*; cutter image adapted from "Coast Guard Cutter ESCANABA (WMEC-907)," Bowsprite, accessed August 27, 2018, https://bowsprite.wordpress.com/tag/nyharbor/.

First, Coast Guard medium endurance cutters are designed and built with a flight deck. The flight deck can be used for a range of functions; however, its primary purpose is to carry, launch, and land helicopters. One type of organic asset is a helicopter, such as the MH-60 or MH-65. A Coast Guard helicopter and its crew are normally part of the ship's company when going out to sea or deploying to the transit zone to conduct its mission. During detection and monitoring, this capability allows the cutter to deploy its organic helicopter to the location of the possible drug activity to detect the target and monitor its activities. Not only can the organic helicopter function in this manner, it can also serve as an extension of the cutter system's capability by relaying what it is detecting on its onboard sensors back to the cutter's system. Being equipped with a flight deck and a helicopter is an advantage for the ship and the mission.

En route to the drug activity location, the Coast Guard cutter uses its onboard electronic sensors, such as radio detection and ranging (RADAR), global positioning system (GPS), and the command, control, computer, communication, intelligence, surveillance, and reconnaissance (C4ISR) suite for navigation and to detect and track the target. GPS allows for real time positioning and used to safely navigate the ship, avoiding hazards to navigation along the way. The SPS-73 surface search radar allows the cutter to pinpoint the exact location of not only itself but also all other contacts it may be tracking on its radar screen. At the same time, the modernized C4ISR suite enhances the cutter's situational awareness, enabling it to better visualize the common operational picture and communicate with base of operations and deployed organic assets.[90]

The cutter's Ship Command and Control System (SCCS) integrates all the different systems and sensors in order to simplify and speed up the operation.[91] All these sensors working together allow for the expedited arrival of the cutter to the location of the drug activity. When the cutter has detected and monitored the suspected drug vessel and a decision is made to interdict, a shift in the tactical control of the situation will occur.

---

[90] "Medium Endurance Cutter," Jane's by IHS Markit, accessed August 27, 2018, https://janes.ihs.com/FightingShips/Display/1355164.

[91] U.S. Coast Guard, "The Cutters, Boats, and Aircraft of the U.S. Coast Guard," 135.

From the time the intelligence of a possible drug activity came in, to the decision of thee cutter to search the vessel, JIATF-S has tactical control of the ship and the situation. However, tactical control shifts to the governing Coast Guard district when the decision to search the drug vessel is made; the law enforcement part of the interdiction process begins.[92]

In the law enforcement part of the process, the Coast Guard first utilizes its onboard armament to serve as protection. The cutter has, in addition to its large 76-mm gun, two .50-caliber machine guns on standby just in case drug traffickers decide to go on the offensive and fire on the ship. The embarked law enforcement detachment team prepares to deploy using one or both the cutter boats—another one of the cutter's organic assets. The law enforcement detachment team then conducts a search of the drug vessel for illicit drugs. If illicit drugs are found, the team seizes the evidence and arrests the drug traffickers.

Armament and smaller boats are usually part of an interdiction vessel, such as a Coast Guard cutter or a Navy frigate, however, the law enforcement detachment team is not. The embarked law enforcement detachment team capability that Coast Guard ships have is significant because it allows the cutter to apply law enforcement on the spot, where other ships cannot; Navy frigates must wait for a Coast Guard ship to arrive to handoff the drug vessel for law enforcement.

B. MK VI PATROL BOAT TECHNOLOGY

In this section, the MK VI technology and capability will be assessed using Braun's "Scope, Technology, Impact, and Policy (STIP)"[93] model, providing an in-depth understanding of the MK VI technology. Understanding the full potential of the MK VI technology is important because its mastery has a direct connection with performance. This section will first introduce the MK VI background followed by its technology and capabilities, and then the overall impact of the MK VI in terms of benefits and challenges.

---

[92] Evan Munsing and Christopher J. Lamb, "Joint Interagency Task Force–South: The Best Known, Least Understood Interagency Success," *Institute for National Strategic Studies*, June 2011, 39, http://www.dtic.mil/dtic/tr/fulltext/u2/a546684.pdf.

[93] Braun, *Technology in Context: Technology Assessment for Managers*, 37.

Although Braun's model can be applied to one specific technology, the focus of this section is not to assess one technology but to assess the overall installed technology and capability of the MK VI patrol boat. Figure 7 displays the MK VI patrol boat and its basic characteristics.

Beam	20.5 ft
Length	84.8 ft
Displacement	170,000 lbs
Speed	35+ kts max; 25+ kts cruise
Fuel Capacity	4000+ gal
Range	600+ nm
Engines	MTU 16V2000 M94 (qty 2)
Installed Horsepower	5200 HP total
Waterjets	Hamilton HM651 (qty 2)
Marine Gear	ZF3060 Gear (2.037:1 ratio)
Genset	33kW Westerbeke

Figure 7. MK VI and its characteristics.[94]

1. MK VI Background

The MK VI patrol boats are assigned to the Coastal Riverine Force, which is a command under the control of the Navy Expeditionary Combat Command. The primary objective of the Coastal Riverine Force "is to conduct maritime security operations across all phases of military operations by providing port and harbor security, and high value asset security inland, on coastal waterways, and ashore."[95] With this in mind, the MK VI patrol boats will be employed to achieve the Coastal Riverine Force's objective, primarily in the littorals. However, the Naval Sea Systems Command reveals that the MK VI's mission is to

> Provide capability to persistently patrol shallow littoral areas beyond sheltered harbors and bays for the purpose of force protection of friendly

[94] Source: "SAFE Boats Receives Order For MK VI Patrol Boats From Navy," The Maritime Executive, July 21, 2015, https://www.maritime-executive.com/corporate/safe-boats-receives-order-for-mk-vi-patrol-boats-from-navy; Source: Chris Rozicer and Jason Marshall, "MK VI Patrol Boat (MK VI PB) Multi Mission Reconfigurable Capabilities," (paper presented at the Multi-Agency Craft Conference, Virginia Beach, VA, June 12, 2014), 9.

[95] "Navy Expeditionary Combat Command," Department of the Navy, 2, https://www.public.navy.mil/NECC/Documents/NECC.pdf.

> and coalition forces and critical infrastructure. Its mission includes high value unit shipping escort; visit, board, search, and seizure operations; theater security cooperation; and security force assistance.[96]

Based on this mission statement, even though the Coastal Riverine Force primarily operates in the littorals, the MK VI is capable of doing much more than operate in brown- and green-water Navy; the MK VI can also operate in blue-water Navy to conduct maritime security operations, such as visit, board, search, and seizures.

The MK VI platform was developed to replace the aging patrol boats of the Navy, such as the MK V and the Sea Ark.[97] At about 84 feet in length, the MK VI is a multi-purpose platform capable of reaching max speed over 35 knots. For the base crew arrangement, the MK VI will have a crew size of ten and can accommodate up to eight passengers, totaling 18 members. Each crew will consist of two teams; each team will be comprised of a boat captain, patrol officer, coxswain, gunner, engineer, and navigator.[98] The MK VI is configured with basic amenities, such as a galley, berthing racks, and shower facilities to support extended missions.[99]

The Navy's contract with SAFE Boats International (SBI) is for a total of 12 MK VI patrol boats, but the Navy plans to acquire up to 48 in total.[100] MK VI one through six were delivered to the Navy between September 2015 and June 2016; MK VI seven through twelve were delivered between June 2017 and April 2018.[101] All twelve MK VI patrol boats were assigned to the Navy Expeditionary Combat Command's Coastal Riverine Force and allocated to various geographic locations (Table 3).

---

96 Rozicer and Marshall, "MK VI Patrol Boat (MK VI PB) Multi Mission Reconfigurable Capabilities," 4.

97 Naval Technology, "MK VI Patrol Boats."

98 Britney Duesler, "New Mark VI Patrol Boat Command Opportunities," *Surface Warfare*, April 2018, https://www.public.navy.mil/surfor/swmag/Pages/NEW-Mark-VI-Patrol-Boat-Command-Opportunities.aspx.

99 Naval Technology, "MK VI Patrol Boats."

100 Naval Technology.

101 Christian E. Rozicer, email message to author, September 27, 2018.

Table 3. Allocation of the 12 MK VI patrol boats.[102]

Echelon	COASTAL RIVERINE FORCE			
	Coastal Riverine Group 1		Coastal Riverine Group 2	
Location	San Diego, CA	Guam (detachment)	Virginia Beach, VA	Bahrain (detachment)
# of MK VI assigned	3	3	3	3

2. MK VI Technology

The MK VI can function in several warfare mission areas. Because of its installed technology and capability, the Navy can employ this platform simultaneously, in three domains: air, underwater, and surface.

First, the MK VI has the capability of launching and recovering unmanned aerial vehicles (UAVs).[103] Depending on the mission scope, the capability of remotely controlling a UAV extends the MK VI's sensor reach in the operating area. This capability would enhance the common operating picture by displaying contacts or targets far from the operating horizon of the MK VI. This aerial capability would allow decision-makers to better manage the positioning of assets.

As an example, the MK VI could remain and patrol in one location while launching the UAV to patrol a different location. This concept would not only give a larger surveillance picture of the operating area but also minimize the fuel burn of the MK VI, which would enable a longer stay time.

[102] Adapted from Christian E. Rozicer, email message to author, September 27, 2018. and Duesler, "New Mark VI Patrol Boat Command Opportunities."

[103] Rozicer and Marshall, "MK VI Patrol Boat (MK VI PB) Multi Mission Reconfigurable Capabilities," 25.

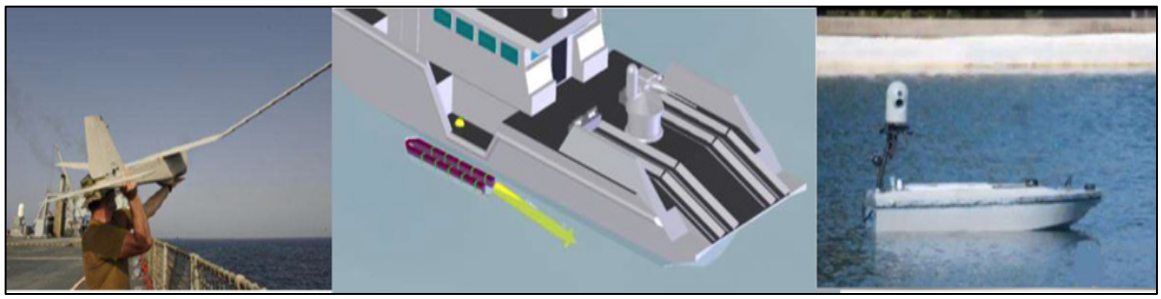

Figure 8. MK VI unmanned vehicle capabilities: Aerial, subsurface, and surface (from left to right).[104]

Next, the MK VI has the capability of launching and recovering unmanned underwater vehicles (UUVs). Specifically, the MK VI can carry up to two MK 18 unmanned underwater vehicles.[105]

These UUVs are designed for the mine warfare mission to locate and neutralize underwater mines. However, they could also function as a surveillance system to locate, identify, and track underwater crafts, such as Colombia's self-propelled semi-submersible watercraft. The underwater capability of the MK VI would extend the sensor reach of its system by using the UUV's camera to get a visualization of the subsurface domain.

This underwater capability is important because it enhances the common operating picture by increasing what the system and operators can see. Moreover, due to an increase in detection in the surface domain, adversaries have been adjusting their operations to the subsurface domain which makes the UUV technology an essential capability for the interdiction mission.

Furthermore, the combined surface technology of the MK VI is remarkable. First is the reconfigurable seating arrangement shown in Figure 9a. The main cabin seating arrangement can be reconfigured from five to thirteen seats, and vice versa, to allow an eight-person visit, board, search, and seizure team, or a law enforcement team to embark for area deployment.

---

104 Source: Rozicer and Marshall, "MK VI Patrol Boat (MK VI PB) Multi Mission Reconfigurable Capabilities."

105 Rozicer and Marshall, 20.

This main cabin reconfiguration is essential in that it allows the MK VI to execute law enforcement missions with a law enforcement team aboard. Second is the installed weapons system. There are nine gunnery stations throughout the MK VI that essentially covers a full 360-degree angle, which protects the MK VI from all directions.[106] Most gunnery stations are manually operated; however, depending on the modification, one- or two-gun systems are remotely operated from the pilot house. Lastly, the MK VI has a robust intelligence, surveillance, and reconnaissance system. Similar to larger Navy ships, the MK VI has a tactical communications suite and video control system that allows operators to communicate with other maritime assets in the operating area. System compatibility with other assets provides a smooth transition of communication, allowing an essential and effective coordinated effort for a particular mission.

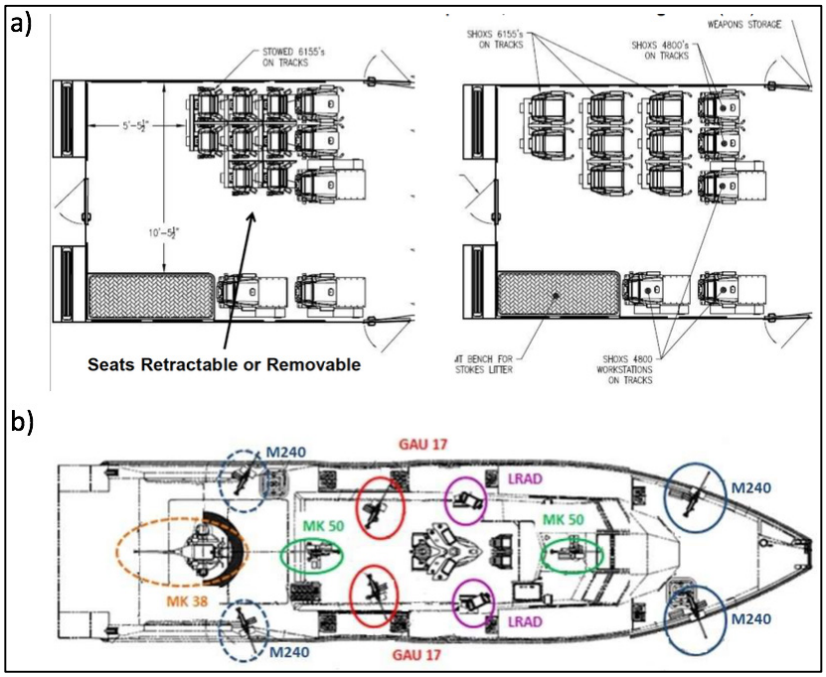

Figure 9. MK VI a) seating and b) weapons configuration.[107]

[106] Rozicer and Marshall, "MK VI Patrol Boat (MK VI PB) Multi Mission Reconfigurable Capabilities," 18.

[107] Source: Rozicer and Marshall, "MK VI Patrol Boat (MK VI PB) Multi Mission Reconfigurable Capabilities."

Finally, in addition to the surface technology described above, the MK VI also has the capability of remotely operating an unmanned surface vehicle (USV), shown in Figure 8. Similar to unmanned aerial and subsurface vehicles, the unmanned surface vehicle would also extend the surface sensor reach of installed radars and cameras, which would essentially enhance the common operating picture. Operators can launch the USV and patrol a certain area while the MK VI remains in position to save fuel or also engage in patrol. This capability, along with the other installed technologies, makes the MK VI a versatile, multi-mission platform.

3. Impact of MK VI Technology

The benefits of the MK VI technology can potentially satisfy economic, social, and political needs. Economically-speaking, building MK VI patrol boats will cost the Navy significantly less, compared to building other Navy ships. The cost to build one Mark VI is around $15 million,[108] which is less expensive compared to other Navy surface combatants. For comparison, the average procurement cost is $194 million per OHP-class frigate,[109] $440 million per Littoral Combat Ship,[110] and $950 million for each of the newly proposed guided missile frigates (FFG[X]).[111] Ultimately, the low cost of MK VI would be beneficial economically because it would allow the Department of the Navy (DON) to build more maritime assets; specifically, the Navy could build approximately 29 MK VI platforms for the price of one littoral combat ship (see Figure 10).

---

[108] Hajek, "MK VI: The Next Generation of Interdiction."

[109] Stolarow, *Navy's FFG-7 Class Frigate Shipbuilding Program and Other Ship Program Issues*, 4.

[110] Ronald O'Rourke, *Navy Littoral Combat Ship (LCS) Program: Background and Issues for Congress*, CRS Report No. RL33741 (Washington, DC: Congressional Research Service, 2013), 6, http://www.dtic.mil/dtic/tr/fulltext/u2/a582220.pdf.

[111] Ronald O'Rourke, *Navy Frigate (FFG[X]) Program: Background And Issues For Congress*, CRS Report No. R44972 (Washington, DC: Congressional Research Service, 2017), 7, https://wayback.archive-it.org/1078/20171205201334/https://fas.org/sgp/crs/weapons/R44972.pdf.

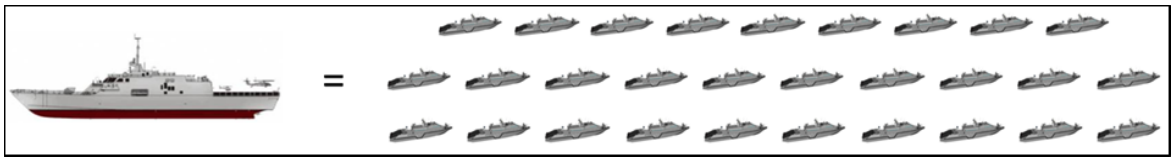

Figure 10. Number of LCS vs. MK VI assets $40 million could procure.

Socially, the use and deployment of the MK VI could potentially have second or third order effects on the social fabric of society in terms of health benefits. Since 2013, the United States has observed an increasing availability and overdose of individuals from cocaine.[112] The increased coca cultivation in Colombia and its subsequent transportation of cocaine through maritime conveyances could explain the increased cocaine availability in the homeland. Using the MK VI would increase the number of maritime security assets which could significantly interrupt the maritime transportation link between drug shipments, which, in turn, significantly lowers the amount of cocaine arriving from maritime routes. The social health benefit, while indirect and observed over long term, would be a huge positive effect nonetheless.

Perhaps the most significant benefit of using the MK VI is in the political environment. As stated earlier, the Navy's 4th Fleet was reestablished with one of its mission as counterdrug operations however, the problem is that 4th Fleet does not own any formidable surface assets. A number of high-ranking officials have mentioned the need for maritime security surface assets in the SOUTHCOM area of operations to accomplish its counterdrug mission. The most recent being Admiral Tidd's testimony to Congress in February 2018 in which he explained shortfall in assets is a primary challenge.[113]

The use and deployment of MK VI satisfies two needs. First, a significant number of MK VI could potentially be assigned to the Navy's 4th Fleet to 1) fill in the lack of surface assets, and 2) execute the counterdrug missions. Second, the use of the MK VI would plug existing security gaps. The U.S. has a cocaine problem arriving from the seas,

---

[112] Austin Frakt, "Overshadowed by the Opioid Crisis: A Comeback by Cocaine," *New York Times*, March 5, 2018, https://www.nytimes.com/2018/03/05/upshot/overshadowed-by-the-opioid-crisis-a-comeback-by-cocaine.html.

[113] Tidd, testimony on 2018 Posture Statement.

and enforces a policy of securing the southern approaches but with very minimal maritime assets. Deploying the MK VI with Coast Guard and partner nation assets would potentially plug maritime security gaps and avoid leaks.

On the negative side, the MK VI contains limitations and challenges within its use. First, the MK VI is designed to accommodate a total of 18 personnel: ten for the crew and eight for other embarked personnel, such as a law enforcement team.[114] Because of this capacity, only 18 personnel can embark the MK VI for deployment and be comfortable onboard. There are only 18 individual seats onboard; therefore, any more personnel would exceed the number of seats and would be left standing and holding on to fixed structures for support. Operationally, this limitation in personnel capacity would present a challenge when confronted with detainees. How and where would the officer-in-charge place the detainees for transport? Detainees could potentially be placed on the floor while sitting down but that presents a security risk depending on the total number to be detained. Moreover, not placing detainees in secured seats would risk their safety and they could potentially get injured depending on sea state.

In addition, the MK VI has a limited fuel capacity designed to carry about 4000 gallons of fuel with a range of about 600 nautical miles. Depending on the operation tempo, this fuel limitation could constitute a challenge. The Center for International Maritime Security asserts that the MK VI operates for about 24 hours before halting its operations due to low fuel.[115] In the event that the MK VI is required to chase a fast boat at full speed—in a number of times throughout a given day—or patrol long stretches of the operating area, the 24-hour operation could potentially be much less. Under those circumstances, the MK VI would only be able to assist in maritime security operation for a limited amount of time before it has to stop to get more fuel. Although this may be true, in reality given this limitation, the MK VI would not be operating by itself or operate far from a fuel source.

---

[114] Naval Technology, "MK VI Patrol Boats."

[115] Hajek, "MK VI: The Next Generation of Interdiction."

Lastly, personnel manning is perhaps the biggest challenge. Generally speaking, the MK VI would most likely operate and deploy in pairs or more, or perhaps with larger Navy ships. Fielding several MK VIs would require personnel trained to operate its systems effectively. Since the MK VI is a relatively new platform, the Navy would need to pull from its current inventory of sailors who are currently not trained to the MK VI systems. Reallocation of personnel and training would require time and money. Under this circumstance, the Navy would need to invest time and money for training to ensure the crew has the competency level needed for the mission.

C. CONCLUSION

Similar to Coast Guard's medium endurance cutters, the technology and capability of the MK VI makes it a formidable asset in counterdrug operations when operating with logistical and maintenance support provided by larger units or a networked infrastructure. Medium endurance cutters, despite being over-aged, will remain the Coast Guard's primary maritime asset for law enforcement and counterdrug missions, and the MK VI can provide assistance and potentially significant results in the counterdrug mission. In his book, Braun states that "Technology has become one of the principal weapons...that can be used both tactically and strategically."[116] Thus, the Navy can take advantage of the MK VI's technological gain to make significant impacts in the counterdrug mission. Addition of the MK VI to JIATF-S's asset inventory will not only improve mission readiness but also satisfy economic, social, and political needs.

[116] Braun, *Technology in Context: Technology Assessment for Managers*, 25.

IV. INTERDICTION STRATEGY AND MK VI TECHNOLOGY

This chapter analyzes the MK VI's fitness for purpose. Chapter II analyzed the maritime interdiction policy and determined the shortfall in maritime assets. Chapter III presented a technology assessment of an alternative platform--the MK VI--that could potentially fill the shortfall in maritime assets. Given this information, this chapter will analyze whether the MK VI is the right platform to fill the shortfall in assets in the maritime interdiction operation. To do this, the first section will evaluate the MK VI's suitability for the mission using various criteria. Then, the second section will list key trade-offs if MK VI implementation is carried out.

A. SUITABILITY

The matrix in Table 4 illustrates five criteria offered by Bardach and Patashnik, contrasted against two different operational environments where the MK VI can be implemented. The outcome is the intersection of criteria and operational environment, and is marked with a "Yes" or "No," which is based on the author's interpretation of the MK VI technology and capability presented in Chapter III. The first part discusses the outcome of the MK VI implemented in the high seas; while the second part discusses the outcome of the MK VI implemented in the littorals.

Table 4. MK VI implementation outcome matrix.[117]

Criteria	Capability	Efficiency	Efficacy	Feasiblity	Measurability
	capable of interdicting drug vessels	add more benefit and minimize cost	reduce number of drug vessels escaping interdiction	implementation achieved easily and conveniently	success can be measured
MK VI implemented in the high seas	Yes	No	Yes	No	Yes
MK VI implemented in the littorals	Yes	Yes	No	Yes	Yes

[117] Criteria adapted from Bardach and Patashnik, *A Practical Guide for Policy Analysis: The Eightfold Path to More Effective Problem Solving*.

1. In the High Seas

As mentioned in an earlier section, the MK VI possesses the technology and capability to participate and contribute in the counterdrug mission. The MK VI has the latest state-of-the-art equipment to detect, monitor, and interdict drug trafficking vessels. The MK VI can deploy its unmanned underwater vehicle to detect drug trafficking organizations' self-propelled semi-submersible watercrafts; it can use an unmanned aerial vehicle to detect surface targets at longer distances; and the MK VI is capable of speeds fast enough to detect and interdict adversaries' fast-boats. Additionally, the MK VI is also capable of carrying a law enforcement team, a capability that takes the detection and monitoring mission of the Navy to the next step in the interdiction process, which is interdiction and arrest. Altogether, the MK VI is capable of interdicting drug vessels in the high seas.

MK VI's implementation in the high seas will provide benefit to the counterdrug mission by applying its technology and capability to catch and remove drug traffickers; however, its application would not necessarily minimize the cost. As shown in Figure 11, cocaine maritime trafficking routes from South America to the various location in the Caribbean and Central America occur far from U.S. coastlines. This means that MK VI would need to be deployed thousands of miles away from its current location. San Diego and Virginia Beach Navy installations are approximately 3,000 miles and 1,000 miles away, respectively, from the Caribbean Sea and the southern region of Central America. The long distance the MK VI would have to travel to the area of operation would drive up fuel cost. MK VI based out of San Diego would need to refuel five times for a one-way trip to the operating area south of Costa Rica and Panama. Similarly, MK VI based out of Virginia Beach would need to refuel about three times for a round trip to the operating area south of Caribbean islands. Moreover, the long distance of travel would drive maintenance to be conducted more frequently thereby increasing cost. Although the MK VI will provide benefits to the maritime security in these operating areas, the distance of travel will drive up the cost in terms of fuel and maintenance, which would not be economically efficient.

Figure 11. Cocaine route out of South America.[118]

The reduction in the number of drug vessels escaping interdiction can result from MK VI implementation with effective employment tactics and logistics. The key problem experienced in SOUTHCOM is the lack of maritime assets to interdict drug smuggling vessels. This shortfall in assets creates security gaps that drug smugglers exploit. Therefore, implementation of the MK VI would provide maritime assets to SOUTHCOM that would be employed to fill security gaps. As a result, the number of drug vessels escaping security interdiction would be dramatically reduced simply because there are more assets available to conduct patrol and interdiction.

Next, the feasibility of MK VI implementation in the high seas would not be easily achieved and sustained. To have a significant impact on maritime security in SOUTHCOM, MK VI would need to be deployed to the operating area in groups or squadrons, not as an individual patrol boat. To avoid the long-distance travel explained above, the Navy could load MK VIs as part of its cargo and deploy them to the operating area. As an example, the Navy landing platform dock (LPD), a type of amphibious ship, can carry up to four MK VIs in its well deck (see Figure 12). The LPD can then transport

118 Source: Office of National Drug Control Policy, *Global Cocaine Trafficking*, 7.

the MK VIs to the operating area. However, this operation would limit the capability of the LPD. Normally, the LPD would have U.S. Marine gear, such as a landing craft air cushion (LCAC), in the well deck to support amphibious operations. Replacing Marine gear with the MK VI would hinder amphibious operations and render the LPD incapable of conducting landing missions or exercises. Moreover, the LPD would need to remain close to the counterdrug operating area to serve as a "home base" for the MK VI, which is something an LPD is not used for. Thus, the feasibility of the MK VI in the high seas cannot be achieved easily and conveniently.

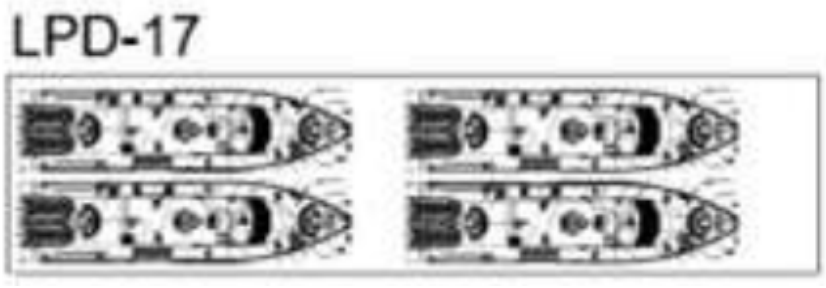

Figure 12. MK VI layout inside an LPD well deck.[119]

Finally, success from MK VI implementation can be measured by the amount of illicit drugs interdicted at sea. To quantify success, just as Coast Guard cutters and past Navy frigates have done, the MK VI can measure the amount of cocaine they confiscate from drug smugglers at sea, or count the number of drug vessels interdicted. Thus, the total amount of illicit drugs removed at sea can be accumulated over a period of time to provide the database success rate and trends for the MK VI.

2. In the Littorals

Implementation of the MK VI in the littorals would satisfy the criterion of capability and measurability listed in Table 4. First, in a similar manner as implementation in the high seas, capability and measurability would remain the same. The MK VI would

[119] Source: Rozicer and Marshall, "MK VI Patrol Boat (MK VI PB) Multi Mission Reconfigurable Capabilities," 24.

still be capable of interdicting drug vessels in the littorals. MK VI could patrol the coastline and stop drug vessels coming from the Caribbean and also interdict the very few drug vessels that transit directly from South America to the United States. Consequently, success of the MK VI in the littorals would be measured by the amount of illicit drugs confiscated or removed from the supply chain.

In contrast with implementation in the high seas, MK VI in the littorals would be both efficient and feasible, but not operationally effective. As of October 2018, three MK VIs are located in San Diego, California and another three MK VIs are located in Virginia Beach, Virginia. Because of this dispersal, the MK VI adds more benefit to the existing security fleet in both San Diego and Virginia Beach and also minimizes cost to the Navy; the Navy would not need an amphibious ship to transport the MK VIs to another location because the MK VIs are already in place to conduct maritime security in the U.S. littorals. Implementation in the U.S. littorals is feasible; the Navy can easily and conveniently implement a policy to use the MK VI for counterdrug operations in the littorals because, as stated above, the MK VI is already in place. Most importantly, however, the MK VI would be homeported in a major fleet concentration area, which essentially means that resources--such as fuel and maintenance facilities--are available.

Unlike the success of the MK VI in reducing drug vessels escaping interdiction in the high seas, implementation of the MK VI in U.S. littorals would not be beneficial to the Navy--and homeland security in general--primarily because of how illicit drugs are routed at sea. Most of the maritime drug trafficking events occur well beyond the littorals of the United States (see Figure 13). Conducting counterdrug operations with the MK VI closer to U.Ss shorelines would not have any dramatic negative effect on drug trafficking organizations' supply chain. In fact, the Drug Enforcement Agency reported that only less than one percent of cocaine maritime drug movements transit directly to U.S. shorelines, while 93–94 percent transit directly to Central America and Mexico, and 6–7 percent transit

directly to the Caribbean islands (see Figure 14).[120] Under those circumstances, implementing the MK VI in U.S. littorals would not reduce the number of drug vessels escaping interdiction.

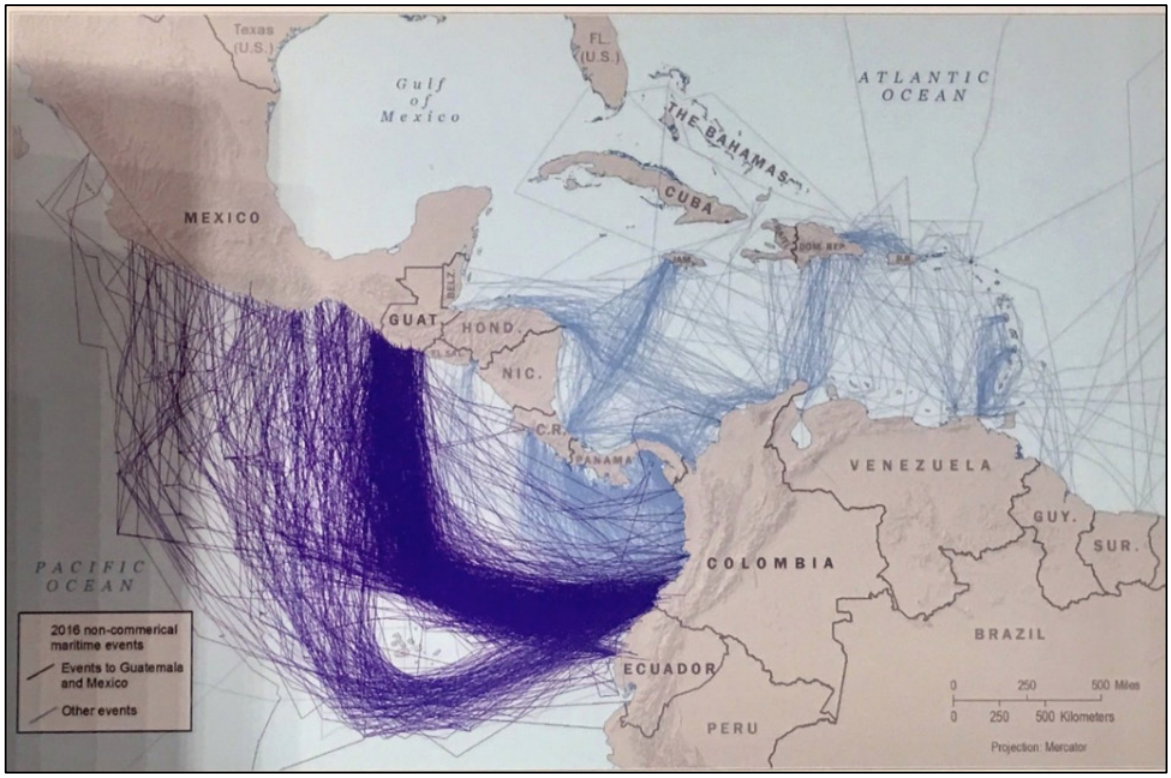

Figure 13. 2016 map of suspected drug trafficking events in the Western Hemisphere.[121]

120 Drug Enforcement Administration Strategic Intelligence Section, *Colombian Cocaine Production Expansion Contributes to Rise in Supply in the United States*, Report No. DEA-DCI-DIB-014-17 (August 2017), 5, https://ndews.umd.edu/sites/ndews.umd.edu/files/dea-colombian-cocaine-production_expansion-contributes-to-rise-in-us-supply2.pdf.

121 Source: *Adapting U.S. Counternarcotics Efforts in Colombia*: Testimony Before the Caucus on International Narcotics Control, United States Senate (2017) (testimony of Vice Admiral Charles W. Ray, Deputy Commandant for Operations, United States Coast Guard).

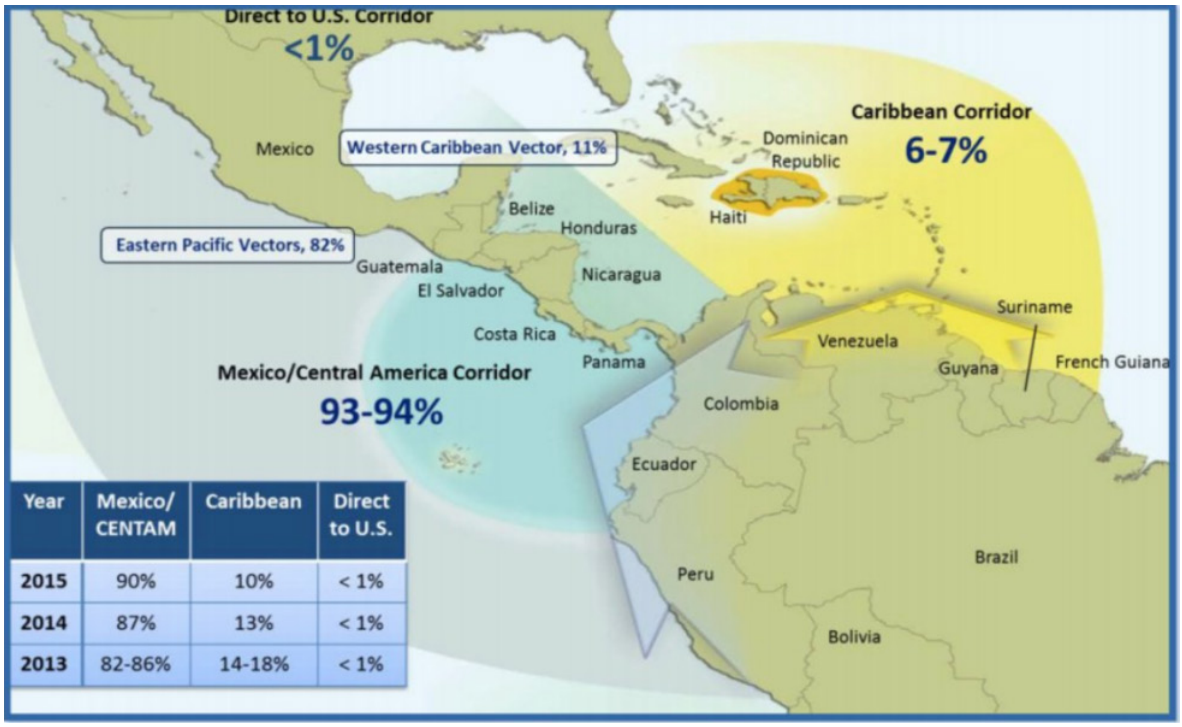

Figure 14. Cocaine maritime route in 2016.[122]

B. TRADE-OFFS

Based on the preliminary assessment of the criteria listed in Table 4, this thesis found that implementation of the MK VI would present decision-makers with key trade-offs. It is important to understand these trade-offs in deciding whether to implement the MK VI in the high seas or the littorals because they assist in realizing the advantages and disadvantages of applying the MK VI in the operating environment.

1. MK VI Operating in U.S. Littorals Would Be More Cost-Efficient but Would Not Significantly Reduce Maritime Drug Smugglers

Maritime drug events are happening in the high seas, therefore that is where the action is and, ultimately, where significantly higher interdiction rates would occur. With the problem of having less maritime assets to stop the increasing availability and flow of illicit drugs, adding MK VI assets seems to be the potential solution; however, placement

[122] Source: Drug Enforcement Administration Strategic Intelligence Section, *Colombian Cocaine Production Expansion Contributes to Rise in Supply in the United States*, 5.

of those MK VIs in the right place is important. Because drug trafficking organizations ship most of their products to Central America and Mexico, the MK VIs should operate in the maritime region between Central and South America. This would give the counterdrug mission a higher rate of success and ultimately reduce the number of vessels escaping interdiction. However, even with the high potential gain, placement of the MK VI in this region would increase cost to the Navy. Additionally, the MK VI would not be easily and conveniently deployed, using a large Navy ship like a LPD, to the region between Central and South America without trading off some key capability that the large ship possesses.

2. The MK VI Would Yield Higher Drug Interdiction Rates on the High Seas but Would Be Too Far Away from Home Base, Which Would Increase Fuel Costs

MK VI counterdrug operation would be more beneficial and cost-efficient in U.S. littorals than in the high seas. With a 600 nautical mile range, the MK VI can certainly conduct counterdrug operations in the littorals up to the 200 nautical mile exclusive economic zone boundary without the boat captain being concerned with fuel consumption. When running low on fuel, the MK VI can easily head back to base to refuel before going back out again. The cost, in terms of fuel, would be minimized depending on the operation tempo of the environment. On the contrary, operation in the high seas would drive up the cost for fuel. Because maritime drug events are happening approximately 3,000 miles away from base of operations in San Diego, the one-way transit would already require the MK VI to refuel five times, and it has not even started its counterdrug operation in the target area. Moreover, the Navy would need to consider where along the 3,000 mile transit the MK VI would stop to refuel and resupply. For these reasons, it would be far more cost-efficient to implement the MK VIs in U.S. littorals.

Overall, the availability of required resources are limitless on land compared to the high seas. The MK VI would need fuel to operate and there would be an abundance of fuel while operating in and around the littorals, especially in fleet concentration areas, such as San Diego and Norfolk, Virginia. In the high seas, one could argue that a larger ship--an LPD--could be used as a source of fuel and would therefore provide what seems to be an endless supply of fuel; however, the LPD would also be needing fuel for operation. In the

event that the LPD is ordered to leave station the MK VI could be left with low levels of fuel and risk safety and security. In the littorals, the MK VI could essentially go to any coastal Navy bases or harbors to fill the tank and continue on with their operation. Land-based refueling seems to present less challenges compared to sea-based refueling.

Equally important are the resources required for maintenance and material. Despite being a relatively new Navy platform, the MK VI will require down time to conduct maintenance, which could vary in degree. If the maintenance requires the MK VI to be lifted up or dry-docked, land-based facilities would have the right equipment and capability to conduct the maintenance. Whereas a larger ship would not only be incapable to support this type of maintenance, the ship would also not be in a stable environment, which would present security concerns. Moreover, the material needed for maintenance, such as spare parts, would be easily and conveniently acquired while on land than compared to the shipment delay while at sea.

THIS PAGE INTENTIONALLY LEFT BLANK

V. CONCLUSION AND RECOMMENDATIONS

A. CONCLUSION

In her *Threats to the Homeland* testimony in October 10, 2018, Secretary of Homeland Security Kirstjen M. Nielsen explains that the homeland is experiencing a growing number of dangers, and the homeland security enterprise needs to be at its strongest.[123] It is no secret that the amount of illicit drugs, especially cocaine, being transported via maritime conveyances has increased. It is also no secret the availability of cocaine in the U.S. market has increased, which results in an increased number of overdose cases. As the number one producer of cocaine, Colombia will continue to exploit the security gap in the maritime domain to deliver their illicit products to the United States market. Due to its large drug fleet, drug trafficking organizations are able to take advantage of the maritime domain and successfully transport their products to their destination. Drug trafficking organizations will continue to pursue maritime conveyances because there is less security, which ultimately gives the drug fleet a high success of delivery. In SOUTHCOM's dynamic threat environment, this maritime security gap can also be exploited by other threats such as terrorist, illegal weapons, human trafficking, etc. Secretary Nielsen concludes that instilling resilience, specifically "Being adaptive to keep pace with our adversaries," is the way to combat threats.[124] For the Navy, this adaptation starts with filling in the security void.

The shortfall in maritime assets in the SOUTHCOM operating area must not continue any longer. If the Navy is serious in its contribution to the homeland's maritime security, then it needs to provide assets--not remove them. The Navy must acknowledge the security gap it created when it removed its main maritime security assets by decommissioning the frigates, and understand the significance of filling in the void to

---

123 *Threats To The Homeland*: Testimony Before the United States Senate Committee on Homeland Security and Governmental Affairs, (2018) (testimony of Kristjen M. Nielsen, Secretary U.S. Department of Homeland Security), 3, https://www.hsgac.senate.gov/imo/media/doc/Testimony-Nielsen-2018-10-10.pdf.

124 Nielsen.

continue the mission and avoid leaks. Immediate replacement of maritime assets is imperative to prevent any drug traffickers from getting passed maritime security and delivering illicit drugs which adversely affect the population. With its newly acquired platform, the Navy can make a significant impact on homeland security by employing the MK VI patrol boat in the counterdrug mission.

The MK VI patrol boat possesses the capability and versatility to conduct counterdrug operations. Even though the Navy did not procure the MK VI to replace the decommissioned frigates, the MK VI contains very similar capabilities that can significantly impact the counterdrug mission. Due to its multi-domain capability, the MK VI can detect, interdict, and seize drug traffickers that utilize underwater crafts. This undersea capability would be a significant adaptation since there have been an increased use of narco subs. The application of MK VI in key littoral areas in the Caribbean and Central America would give JIATF-S a capable instrument to detect, interdict, and seize drug traffickers thereby interrupting the transportation link of drug trafficking organizations. Together with JIATF-S's and partner nations' maritime assets, the addition of the MK VI would establish a significant maritime security barricade that would force the adversaries to reconsider their actions.

The immense size of the adversaries' drug fleet requires a formidable and capable counterdrug fleet. Several partner nations in Central and South America are engaged in the fight against drugs--both on land and water. Partner nations in other parts of the world, such as Canada and Western Europe, have also provided maritime assets and joined the counterdrug operation. However, despite the continuous contribution from partner nations, shortfalls in U.S. maritime assets still exist. Although homeland security is not its primary mission, the Navy must continue its asset contribution to SOUTHCOM in order for the United States to significantly affect drug trafficking organizations' drug operations. Because of the dynamic security environment in SOUTHCOM, the Navy and all services involved must adapt in order to protect the maritime domain and the homeland. The ultimate goal is to defeat adversaries who have the intent, capability, and opportunity to do harm; this effort starts with making maritime security stronger and more effective by increasing its number of assets to fill the security void.

B. RECOMMENDATIONS

Based on the suitability and trade-offs presented in the previous chapter, the Navy needs to be creative and bold in the employment of the MK VI. This chapter presents three potential solutions on how the MK VI could make an impact in the counterdrug operations.

1. Procure More MK VI Patrol Boats

Located in Tacoma, Washington, SAFE Boats International shipyard has a large facility that can build MK VI at a fast pace. Between September 2015 and April 2018, SAFE Boats International shipyard built and delivered twelve MK VI patrol boats to the Navy; a pace of four MK VIs annually. As stated by Safe Boats International, "The size and configuration of the facility allows several MK VI PB size craft to be under construction simultaneously."[125] Safe Boats International construction limits may have existed based on the initial contract of six MK VI. However, if the Navy awards a contract for several more (20-25) MK VIs, then Safe Boats International may arrange the shipyard facility to support delivery of more than four MK VIs per year. As of October 2018, there are twelve MK VIs in operation in various locations shown in Table 3.

In order to have a significant impact in interdiction operations, the Navy would need to procure more MK VI. A large inventory of maritime assets would allow JIATF-S to plug gaps in security that drug traffickers exploit, which would increase interdiction events. The ultimate goal is to stop and remove as much illicit drugs as possible at sea before they reach their interim or final destination.

2. Deploy the MK VI to Potential Forward Bases

After the procurement of more MK VIs, the Navy should deploy these assets to forward operating bases. There are several countries in Central and South America (see Figure 15) who are engaged in maritime interdiction operations, and all these countries are considered partner nations and part of JIATF-S's network. In the Atlantic Ocean region of SOUTHCOM, there are two prominent naval bases from where the MK VI can operate--

125 "SAFE Boats International Awarded Contract For Additional US Navy MK VI Patrol Boats," SAFE Boats International, July 8, 2014, http://www.safeboats.com/company/press-release.php?entity=71&.

Naval Station Guantanamo Bay in Cuba and the former Naval Station Roosevelt Roads in Puerto Rico. Allocation of the MK VI in those two bases would, first, set a layered defense for the Caribbean region. Coast Guard and partner nations' assets would cover the high seas while the MK VI and other CBP assets would cover the littoral region of the Caribbean. This would allow the littoral assets to interdict drug movements that get passed the assets in the high seas.

Second, the MK VI would bring versatile capabilities that the region needs. In 2014, Gibson reported that a shift in smuggling operations exists from the Southwest border of the United States to the Southeast--specifically Florida--and the Caribbean region serves as a stop-point for smugglers before making the transition to the U.S. coastline.[126] Furthermore, because of the increase in illicit drug events in the Caribbean, CBP has allocated some of its maritime assets to align with drug movements. Johnny Morales, Director of CBP's Caribbean Branch, stated that the new marine facility in the former Naval Station Roosevelt Roads "Provides us with a centralized location to more effectively conduct our mission to interdict drugs, and protect the American people."[127] Allocation of the MK VI in Guantanamo Bay and Roosevelt Roads would increase the capabilities of JIATF-S in SOUTHCOM and prevent drug traffickers from reaching the Caribbean.

---

[126] Gibson, "Shifting Drug Smuggling Routes Bring Contraband to Florida."

[127] "CBP's Air and Marine Operations Opens New Marine Unit Facility in Puerto Rico," United States Customs and Border Protection, August 30, 2018, https://www.cbp.gov/newsroom/local-media-release/cbp-s-air-and-marine-operations-opens-new-marine-unit-facility-puerto.

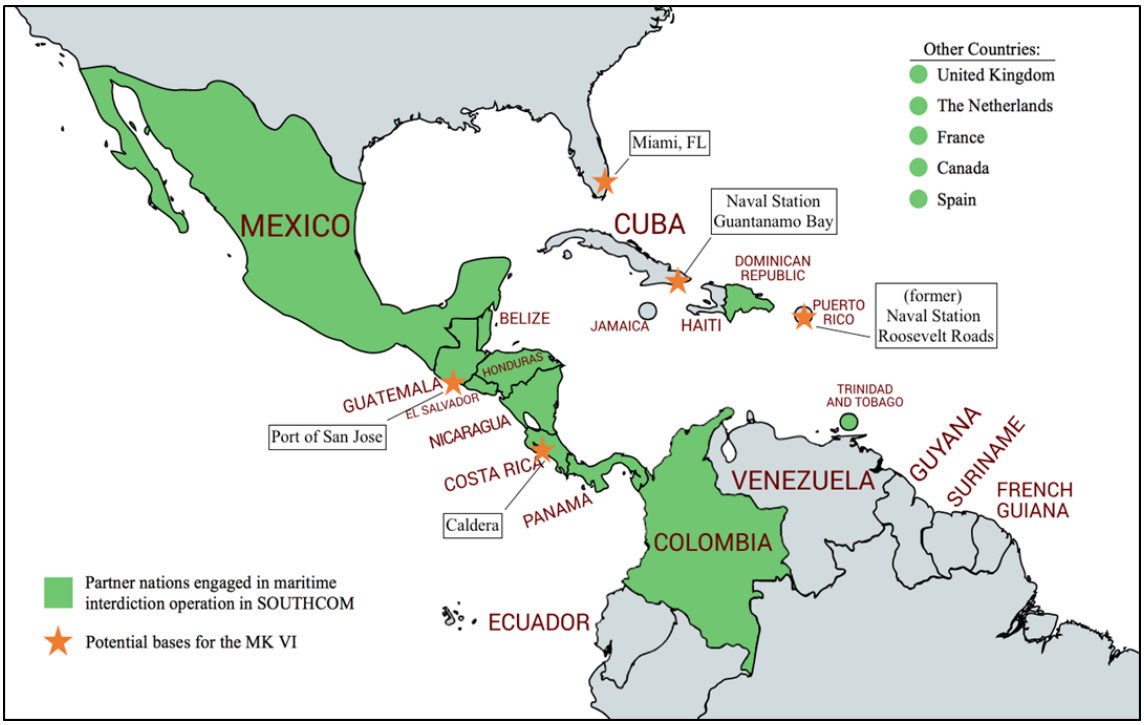

Figure 15. Partner nations involved in counterdrug operations.[128]

In the Pacific Ocean region of SOUTHCOM, there are no forward U.S. naval bases that the MK VI can operate from; however, all of Central America are partner nations that conduct interdiction operations with U.S. assets. Perhaps the Navy could consider any of the countries in Central America as a temporary homeport for the MK VI. Allocation of the MK VI in non-U.S. bases would present challenges, such as in security and policy, but nonetheless an option to consider.

The drug-infested operational environment requires adaptive forces; perhaps multinational naval forces can operate out of the same naval base in order to serve the common interest. Two naval bases can potentially serve as homeports for the MK VI--Port of San Jose in Guatemala and Caldera in Costa Rica. Guatemala and Costa Rica are chosen because of its close vicinity to trafficking routes (see Figure 13), and, more importantly, Guatemala is the target destination of drug trafficking organizations because of the porous

[128] Adapted from *Posture Statement of Admiral Kurt W. Tidd, Commander, United States Southern Command: Before the 115th Congress Senate Armed Services Committee (2018)*.

Mexico-Guatemala border.[129] Allocation of MK VI in these two locations, along with U.S. Special Forces already operating on land, would significantly increase maritime security in the Eastern Pacific Ocean. Furthermore, both Costa Rican and Guatemalan naval forces are jointly connected with U.S. naval forces in the counterdrug operation. In fact, Operation Kraken and Operation Martillo, which are multinational naval operations designed to target Central American littorals,[130] have been successful in interdicting drug traffickers. In June 2018, Costa Rica, U.S., Colombia, and other nations participated in Operation Kraken, which resulted in the seizure of approximately 19.5 tons of cocaine.[131]

3. Use Fuel Buoys or Host Ship for Refueling

Illustrated in Figure 16, fuel buoys can be used by the MK VI to extend its counterdrug mission into a specific area. The Naval Surface Warfare Center has designed and built a portable fueling station capable of being deployed either from an aircraft or ship to any marine location.[132] Deployment of multiple floating fuel stations in maritime locations aligned with potential bases shown in Figure 15 would lessen the need for the MK VI to return to its homeport to refuel, which would allow the Navy to remain in its mission area.

---

[129] Tidd, 16.

[130] Tidd, 15; U.S. Southern Command, "Operation Martillo," accessed October 9, 2018, http://www.southcom.mil/Media/Special-Coverage/Operation-Martillo/.

[131] Julieta Pelcastre, "Colombia Closes Sea Routes to International Narcotrafficking," *Dialogo Americas*, June 13, 2018, https://dialogo-americas.com/en/articles/colombia-closes-sea-routes-international-narcotrafficking.

[132] "Remote Autonomous Refueling Buoy," TechLink Center, accessed October 23, 2018, https://techlinkcenter.org/technologies/remote-autonomous-refueling-buoy/.

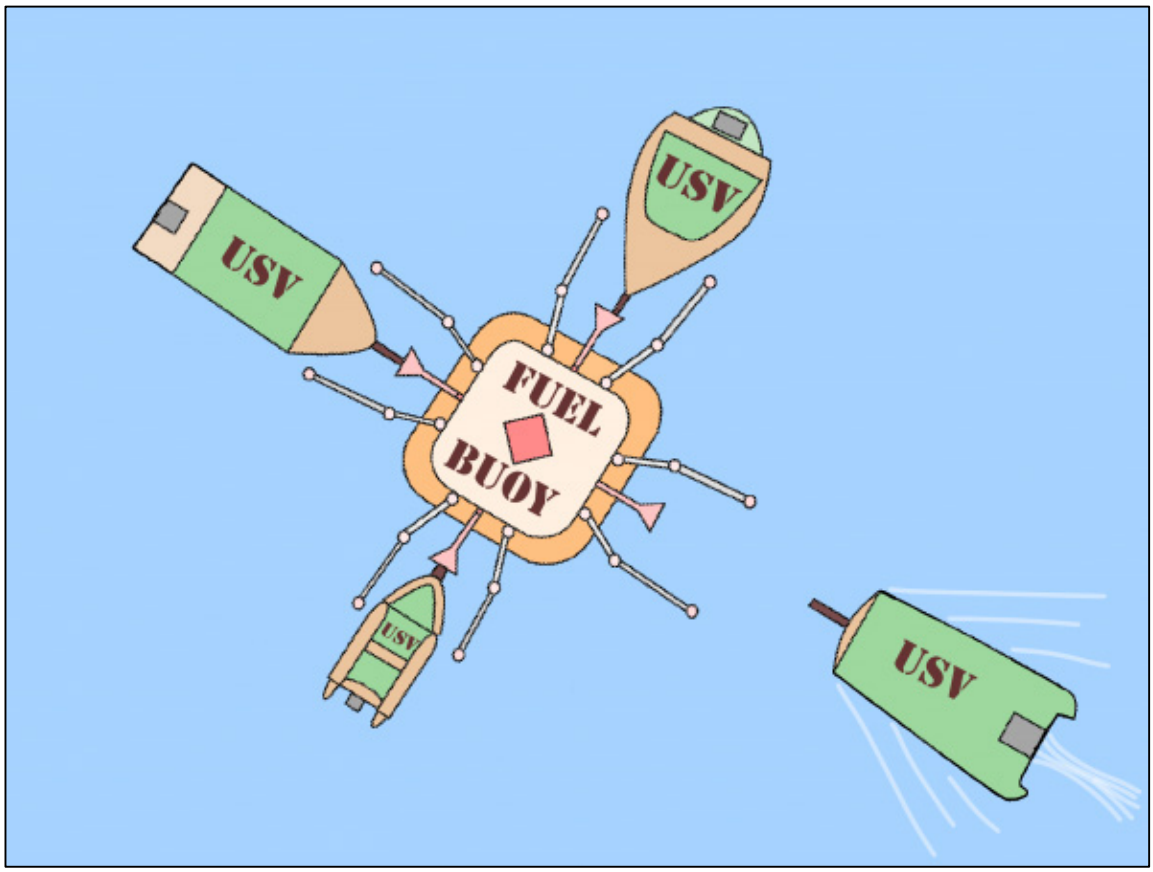

Figure 16. Floating fuel buoy for craft refueling.[133]

Moreover, the MK VI could also utilize U.S. maritime assets deployed in the mission area as a source of fuel. If operating nearby, Coast Guard cutters or Navy warships can conduct an underway replenishment with the MK VI in order to refill its fuel tank. One way to refuel with a host ship is depicted in Figure 17, where the MK VI would connect via lines and hoses astern of the host ship.[134] A second way to refuel would be the more traditional underway replenishment connection where both the MK VI and the host ship would be connected via lines and hoses side-by-side.[135] Similar to a fueling buoy, the MK

[133] Source: TechLink Center.

[134] Robert J. Galway, "Autonomous Refueling of Unmanned Vehicles at Sea," Office of Naval Research, March 2008, 9-10, http://www.dtic.mil/dtic/tr/fulltext/u2/a530597.pdf.

[135] "MK VI in Port Refueling Alongside USS Coronado," *Defense Visual Information Distribution Service*, August 16, 2017, https://www.dvidshub.net/image/3680353/mk-vi-port-refueling-alongside-uss-coronado.

VI would have the capability to stay longer in its mission area because returning to homeport to refuel would not be required.

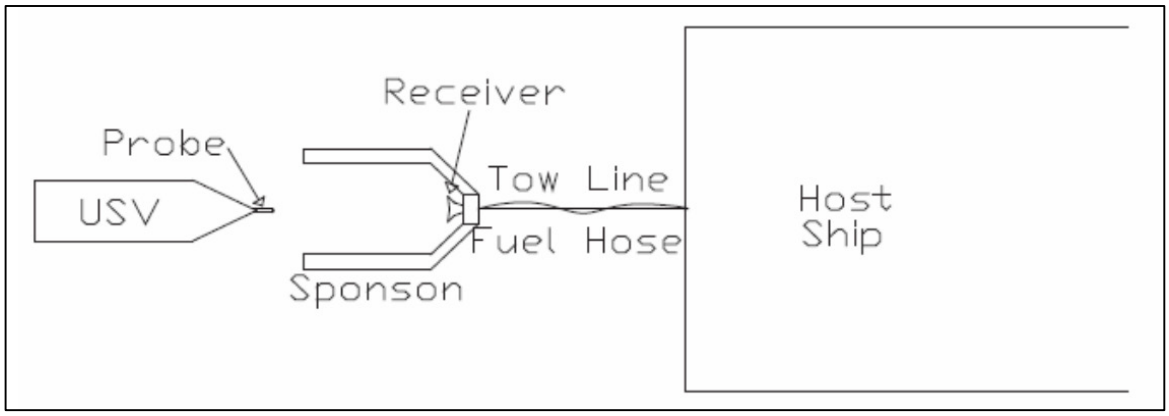

Figure 17. Host ship refueling.[136]

In sum, the Navy has options on how best to deploy the MK VI to make a significant impact on the counterdrug mission. Creating more MK VI would assist in building the counterdrug fleet; deploying MK VIs to forward operating bases would not only keep drugs far away from U.S. coastline but also put assets where "the fight" is located. To utilize MK VI refueling at sea would allow for longer missions--all of which establishes a JIATF-S counterdrug posture that is capable of dramatically stopping the maritime transport of illicit drugs.

[136] Source: Robert J. Galway, "Autonomous Refueling of Unmanned Vehicles at Sea," 10.

LIST OF REFERENCES

Atkinson, Michael P., Moshe Kress, and Roberto Szechtman. "Maritime Transportation of Illegal Drugs from South America." *The International Journal on Drug Policy* 39 (January 2017): 43–51. https://doi.org/10.1016/j.drugpo.2016.07.010.

Bardach, Eugene, and Eric M. Patashnik. *A Practical Guide for Policy Analysis: The Eightfold Path to More Effective Problem Solving*. 5th ed. Thousand Oaks, CA: CQ Press, 2016.

Bowsprite. "Coast Guard Cutter ESCANABA (WMEC-907)." Accessed August 27, 2018. https://bowsprite.wordpress.com/tag/nyharbor/.

Braun, Ernest. *Technology in Context: Technology Assessment for Managers*. New York: Routledge, 2005. http://erl.ucc.edu.gh:8080/jspui/bitstream/123456789/2997/1/%5BErnest_Braun%5D_Technology_in_Context_Technology_A%28BookZZ.org%29.pdf.

Defense Visual Information Distribution Service. "MK VI In Port Refueling Alongside USS Coronado." August 16, 2017. https://www.dvidshub.net/image/3680353/mk-vi-port-refueling-alongside-uss-coronado.

Department of Defense. *Summary of the 2018 National Defense Strategy of the United States of America*. Washington, DC: Department of Defense, 2017. https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf.

Department of the Navy. *Executive Summary: 2016 Navy Force Structure Assessment (FSA)*. December 14, 2016. https://news.usni.org/wp-content/uploads/2016/12/FSA_Executive-Summary.pdf.

———. *Financial Management Policy Manual*. Washington, DC: Department of the Navy, 2017. http://www.secnav.navy.mil/fmc/Documents/FINAL-Financial-Management-Policy-Manual-FMPM.pdf.

———. "Navy Expeditionary Combat Command." Accessed October 1, 2018. https://www.public.navy.mil/NECC/Documents/NECC.pdf.

Donohue, Ryan P. "US Navy Bloodhounds: Establishing a New Maritime Security Combatant." Master's thesis, Naval Postgraduate School, 2016. https://calhoun.nps.edu/handle/10945/49445.

Drug Enforcement Administration Strategic Intelligence Section. *Colombian Cocaine Production Expansion Contributes to Rise in Supply in the United States*. Report No. DEA-DCI-DIB-014-17. Springfield, VA: Drug Enforcement Administration, August 2017. https://ndews.umd.edu/sites/ndews.umd.edu/files/dea-colombian-cocaine-production_expansion-contributes-to-rise-in-us-supply2.pdf.

Duesler, Britney. "New Mark VI Patrol Boat Command Opportunities." *Surface Warfare*. April 2018. https://www.public.navy.mil/surfor/swmag/Pages/NEW-Mark-VI-Patrol-Boat-Command-Opportunities.aspx.

Ferdinando, Lisa. "Admiral Highlights Southcom's Strengthened Partnerships." *DoD News*, March 5, 2018. http://www.southcom.mil/MEDIA/NEWS-ARTICLES/Article/1458537/admiral-highlights-southcoms-strengthened-partnerships/.

Frakt, Austin. "Overshadowed by the Opioid Crisis: A Comeback by Cocaine." *New York Times*, March 5, 2018. https://www.nytimes.com/2018/03/05/upshot/overshadowed-by-the-opioid-crisis-a-comeback-by-cocaine.html.

Galway, Robert J. "Autonomous Refueling of Unmanned Vehicles at Sea." Office of Naval Research. March 2008. http://www.dtic.mil/dtic/tr/fulltext/u2/a530597.pdf.

Gibson, William E. "Shifting Drug Smuggling Routes Bring Contraband to Florida." *SunSentinel*, April 5, 2014. http://articles.sun-sentinel.com/2014-04-05/news/fl-drug-smuggling-routes-20140404_1_central-florida-south-florida-cocaine-shipments.

Hajek, Lawrence Albert. "MK VI: The Next Generation of Interdiction." Center for International Maritime Security. May 16, 2016. http://cimsec.org/mk-vi-next-generation-interdiction/23497.

Inspector General U.S. Department of Defense. *Independent Auditor's Report On The FY 2017 DoD Performance Summary Report For The Funds Obligated For National Drug Control Program Activities*. Report No. DODIG-2018-066. Washington, DC: Department of Defense, 2018. https://media.defense.gov/2018/Feb/02/2001873207/-1/-1/1/DODIG-2018-066.PDF.

Jane's by IHS Markit. "Medium Endurance Cutter." Accessed August 27, 2018. https://janes.ihs.com/FightingShips/Display/1355164.

Keller, John. "A Once-Proud Class of U.S. Navy Surface Warships Is Quickly Fading Away." Military & Aerospace. November 4, 2014. http://www.militaryaerospace.com/articles/2014/11/frigates-face-end.html.

The Maritime Executive. “SAFE Boats Receives Order For MK VI Patrol Boats From Navy.” July 21, 2015. https://www.maritime-executive.com/corporate/safe-boats-receives-order-for-mk-vi-patrol-boats-from-navy.

Miles, Donna. “Interagency Task Force Mounts Aggressive Counterdrug Effort.” DoD News, May 30, 2012. http://archive.defense.gov/news/newsarticle.aspx?id=116547.

Mooshegian, Matthew S. “A Probabilistic Model of Illegal Drug Trafficking Operations in the Eastern Pacific and Caribbean Sea.” Master’s thesis, Naval Postgraduate School, 2013. http://www.dtic.mil/dtic/tr/fulltext/u2/a589558.pdf.

Munsing, Evan and Christopher J. Lamb. “Joint Interagency Task Force–South: The Best Known, Least Understood Interagency Success.” Institute for National Strategic Studies. June 2011. http://www.dtic.mil/dtic/tr/fulltext/u2/a546684.pdf.

National Oceanic and Atmospheric Administration. “The United States Is An Ocean Nation.” August 17, 2018. https://www.gc.noaa.gov/documents/2011/012711_gcil_maritime_eez_map.pdf.

Naval Technology. “MK VI Patrol Boats.” Accessed January 29, 2018. https://www.naval-technology.com/projects/mk-vi-patrol-boats/.

Nieto-Gomez, Rodrigo. “Stigmergy at the Edge: Adversarial Stigmergy in the War on Drugs.” *Cognitive Systems Research* 38 (June 1, 2016): 31–40. https://doi.org/10.1016/j.cogsys.2015.12.005.

O’Rourke, Ronald. *Navy Frigate (FFG[X]) Program: Background And Issues For Congress*. CRS Report No. R44972. Washington, DC: Congressional Research Service, 2017. https://wayback.archive-it.org/1078/20171205201334/https://fas.org/sgp/crs/weapons/R44972.pdf.

———. *Navy Littoral Combat Ship (LCS) Program: Background and Issues for Congress*. CRS Report No. RL33741. Washington, DC: Congressional Research Service, 2013. http://www.dtic.mil/dtic/tr/fulltext/u2/a582220.pdf.

Office of Inspector General. *DHS Drug Interdiction Efforts Need Improvement*. Report No. OIG-17-09. Department of Homeland Security, November 8, 2016. https://permanent.access.gpo.gov/gpo76533/OIG-17-09-Nov16.pdf.

———. *Review of U.S. Coast Guard’s Fiscal Year 2016 Drug Control Performance Summary Report*. Report No. OIG-17-33. Department of Homeland Security, February 1, 2017. https://www.oig.dhs.gov/sites/default/files/assets/2017/OIG-17-33-Feb17.pdf.

———. *Review of U.S. Coast Guard's Fiscal Year 2017 Drug Control Performance Summary Report*. Report No. OIG-18-43. Department of Homeland Security, January 30, 2018. https://www.oig.dhs.gov/sites/default/files/assets/2018-02/OIG-18-43-Jan18.pdf.

Office of National Drug Control Policy. *Global Cocaine Trafficking*. Washington, DC: The White House, 2017. https://www.whitehouse.gov/sites/whitehouse.gov/files/ondcp/global_cocaine_trafficking.pdf.

Pelcastre, Julieta. "Colombia Closes Sea Routes to International Narcotrafficking." *Dialogo Americas*. June 13, 2018. https://dialogo-americas.com/en/articles/colombia-closes-sea-routes-international-narcotrafficking.

Phillips, Matthew and Joseph B. Kuhns. "Illicit Drug Trafficking." In *Transnational Crime and Global Security*, edited by Philip L. Reichel and Ryan Randa, 3–22. Santa Barbara, CA: ABC-CLIO, 2018.

Rogoway, Tyler. "The Navy's Long Overdue Smart & Deadly Patrol Boat Has Arrived." *Foxtrot Alpha*, September 7, 2014. https://foxtrotalpha.jalopnik.com/the-navys-long-overdue-smart-deadly-patrol-boat-has-a-1631598708.

Rozicer, Chris and Jason Marshall. "MK VI Patrol Boat (MK VI PB) Multi Mission Reconfigurable Capabilities." Paper presented at the Multi-Agency Craft Conference, Virginia Beach, VA, June 12, 2014.

SAFE Boats International. "SAFE Boats International Awarded Contract For Additional U.S. Navy MK VI Patrol Boats." July 8, 2014. http://www.safeboats.com/company/press-release.php?entity=71&.

Shipbuilders Council of America. "U.S. Navy Shipbuilding." Accessed March 8, 2018. https://shipbuilders.org/us-navy-shipbuilding.

Stolarow, Jerome H. *Navy's FFG-7 Class Frigate Shipbuilding Program and Other Ship Program Issues*. GAO-108301. Washington, DC: Government Accountability Office, 1979.

TechLink Center. "Remote Autonomous Refueling Buoy." Accessed October 23, 2018. https://techlinkcenter.org/technologies/remote-autonomous-refueling-buoy/.

U. S. Coast Guard. *Component Overview*. Department of Homeland Security, 2016. https://www.uscg.mil/Portals/0/documents/PTT_USCG1.pdf?ver=2016-09-06-163615-050.

———. “Strategic Challenges Facing Our Nation - U.S. Coast Guard Perspective.” December 2, 2016. https://www.work.uscg.mil/Portals/6/Documents/PDF/Strategic%20Challenges%20Facing%20our%20Nation_US%20Coast%20Guard%20Perspective_WITH%20COVER.pdf?ver=2016-12-12-142116-477.

———. “The Cutters, Boats, and Aircraft of the U.S. Coast Guard,” 2016. http://www.overview.uscg.mil/Portals/6/Documents/PDF/CG_Cutters-Boats-Aircraft_2015-2016_edition.pdf?ver=2016-10-19-153700-540.

U.S. Customs and Border Protection. “From the Air and Sea.” December 21, 2017. https://www.cbp.gov/border-security/air-sea.

U.S. Government Accountability Office. *Improved Acquisition Portfolio Management Could Help Address Aging Assets and Capability Gaps*. GAO-18-629T. Washington, DC: Government Accountability Office, 2018.

———. *Overview of U.S. Efforts in the Western Hemisphere*. GAO-18-10. Washington, DC: Government Accountability Office, 2017.

U.S. Navy. “Mark VI Patrol Boat.” January 12, 2018. http://www.navy.mil/navydata/fact_display.asp?cid=4200&tid=2600&ct=4.

———. “Status of the Navy.” Accessed August 17, 2018. http://www.navy.mil/navydata/nav_legacy.asp?id=146.

U.S. Navy, U.S. Marine Corps, U.S. Coast Guard. *A Cooperative Strategy for 21st Century Seapower*. Washington, DC: March 2015. http://www.navy.mil/local/maritime/150227-CS21R-Final.pdf.

———. *Naval Operations Concept 2010*: Implementing the Maritime Strategy. Washington, DC: 2010. http://www.navy.mil/maritime/MaritimeStrategy.pdf.

U.S. Southern Command. “Operation Martillo.” Accessed October 9, 2018. http://www.southcom.mil/Media/Special-Coverage/Operation-Martillo/.

———. “U.S. Hosts International Meeting On Maritime Security.” January 19, 2018. http://www.southcom.mil/MEDIA/NEWS-ARTICLES/Article/1420120/us-hosts-international-meeting-on-maritime-security/.

———. “USS Zephyr Conducts Counternarcotics Operations.” November 13, 2017. http://www.southcom.mil/MEDIA/NEWS-ARTICLES/Article/1370250/uss-zephyr-conducts-counternarcotics-operations/.

Under Secretary of Defense. *Department of Defense Financial Management Regulation - Volume 2B: Budget Formulation and Presentation (Chapters 4–19)*. DoD 7000.14-R. Washington, DC: Department of Defense, 2017. http://comptroller.defense.gov/Portals/45/documents/fmr/Volume_02b.pdf.

United Nations Office on Drugs and Crime. "World Drug Report 2017: Booklet 3 - Market Analysis of Plant-Based Drugs - Opiates, Cocaine, Cannabis." Vienna, Austria: United Nations Office on Drugs and Crime, 2017. https://www.unodc.org/wdr2017/field/Booklet_3_Plantbased_drugs.pdf.

———. "World Drug Report 2018: Booklet 3 - Market Analysis of Plant-Based Drugs - Opiates, Cocaine, Cannabis." Vienna, Austria: United Nations Office on Drugs and Crime, 2018. https://www.unodc.org/wdr2018/prelaunch/WDR18_Booklet_3_DRUG_MARKETS.pdf.

United States Customs and Border Protection. "CBP's Air and Marine Operations Opens New Marine Unit Facility in Puerto Rico." August 30, 2018. https://www.cbp.gov/newsroom/local-media-release/cbp-s-air-and-marine-operations-opens-new-marine-unit-facility-puerto.

United States Department of Justice Drug Enforcement Administration. *2017 National Drug Threat Assessment*. Report No. DEA-DCT-DIR-040-17. Springfield, VA: Drug Enforcement Administration. October 2017. https://www.dea.gov/docs/DIR-040-17_2017-NDTA.pdf.

United States Department of State. "2016 International Narcotics Control Strategy Report: Volume I - Drug and Chemical Control." Washington, DC: Department of State, 2016. https://www.state.gov/j/inl/rls/nrcrpt/2016/vol1/253221.htm.

Werner, Dave. "Last of Its Kind - Oliver Hazard Perry Class Frigates Sail into Naval History." *All Hands*. September 29, 2015. http://www.navy.mil/ah_online/deptStory.asp?id=91288&issue=3&dep=8.

The White House. "Major Drug Transit or Major Illicit Drug Producing Countries for Fiscal Year 2017." Official memorandum. Washington, DC: The White House, 2016. https://obamawhitehouse.archives.gov/the-press-office/2016/09/12/presidential-determination-major-drug-transit-or-major-illicit-drug.

Woody, Christopher. "The Coast Guard Is Increasingly Facing A Stealthy New Breed Of Drug Smuggler." *Task & Purpose*. September 20, 2017. https://taskandpurpose.com/coast-guard-narco-submarine-drugs.

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
   Ft. Belvoir, Virginia

2. Dudley Knox Library
   Naval Postgraduate School
   Monterey, California