THE U.S. NAVY SURFACE FORCE'S NECESSARY CAPABILITIES AND FORCE STRUCTURE FOR HUMANITARIAN ASSISTANCE AND DISASTER RELIEF (HA/DR) OPERATIONS

A Master's Thesis
submitted to the Faculty of the
Graduate School of Arts and Sciences
of Georgetown University
in partial fulfillment of the requirements for the
degree of
Master of Arts
in Security Studies

By

Louis P. Bergeron, M.S.

Washington, DC
April 15, 2011

THE U.S. NAVY SURFACE FORCE'S NECESSARY CAPABILITIES AND FORCE STRUCTURE FOR HUMANITARIAN ASSISTANCE AND DISASTER RELIEF (HA/DR) OPERATIONS

Louis P. Bergeron, M.S.

Thesis Advisor: Karl P. Mueller, Ph.D.

ABSTRACT

The U.S. Navy has become a first-responder for several of the worst natural disasters over the past decade. Rather than complain about this role, the Navy embraced their participation in humanitarian assistance and disaster response (HA/DR) by incorporating it as a core competency in their 2007 maritime strategy. This thesis explains the naval capabilities useful in conducting HA/DR and the relative strengths and weaknesses of current and future naval platforms in performing HA/DR.

The research and writing of this thesis
is dedicated to all the men and women of the U.S. Navy who
put their lives on the line for the less fortunate daily –
the Navy truly is a "global force for good."

To my love Sarah - she has supported me every step of my graduate odyssey –
thank you from the bottom of my heart.

To my family and friends –
I hope to reconnect with you more as this stage of my life is complete. Thank you to all who have supported. I am truly grateful and humbled.

And lastly, to my dear friend Steve Anderson who was taken unexpectedly from this world – I cherish the friendship we shared for over 20 years.

Many thanks,
LOUIS P. BERGERON

TABLE OF CONTENTS

Introduction:

> *"During the nineteenth and most of the twentieth centuries, the very thought that sea powers might regularly use naval platforms to deliver humanitarian aid, as opposed to cutting off and starving an enemy's supply lines, would have seemed alien. In the twenty-first century, however, national power and prestige are more and more characterized by "soft power." UNIFIED ASSISTANCE [in Indonesia] showed that "hard power" assets like aircraft carriers can also be the best providers of "soft power." The UNIFIED ASSISTANCE model developed in northern Indonesia was a real-life example of how such a "soft power" humanitarian relief operation can work in practice."* [1]
>
> – Bruce Elleman, *Waves of Hope*

Within hours of the March 2011 tsunami in Japan, the United States Navy had already publicly committed the full weight of their naval presence in Japan to assist in rescue, medical, and relief efforts for Japan's tragedy-stricken disaster areas. The quick and dynamic U.S. Navy response demonstrated how the Navy recognizes the critical role naval forces play in Humanitarian Assistance/Disaster Relief (HA/DR) operations worldwide - this was not by accident. In 2007, the Navy sensed a new course for naval forces. So, while the nation's attention focused on protracted land engagements in Iraq and Afghanistan, naval leadership, along with Coast Guard and Marine Corps participation, laid out a new strategy called the *Cooperative Strategy for 21st Century Seapower (CS21).* [2] *CS21* stresses the national security necessity of having a flexible, responsive, and persistent naval surface force capability. *CS21* also highlights the need for the naval services to practice a blend of "hard" and "soft" power. While hard power represents the ability for Navy to project power ashore and to control the sea[3], soft power means proactively engaging with international partners, and potential partners, using naval forces to gain influence with a nation's leadership as well as positively shaping public perceptions of the United

[1] Elleman, Bruce A., Waves of Hope, (Newport, RI: Naval War College Newport Papers, Volume 28, February 2007), p.117.

[2] Department of the Navy and U.S. Coast Guard (ADM Gary Roughead, USN; Gen James T. Conway, USMC; and ADM Thad W. Allen, USCG) *A Cooperative Strategy for 21st Century Seapower (CS21),* Oct 2007, p. 1 – Will be referred to as *"CS21"* for the remainder of the document.

[3] The Navy projects power ashore through means such as Tomahawk strikes, strikes by aircraft carrier assets, amphibious landings with Marines, or strategic submarine launches. Control of the sea is the ability to operate unrestricted in an area, while denying an adversary use of the sea.

States. The particular focus on the soft power aspects of naval forces represented a codification of the lessons learned in practicing soft power missions following September 11, 2001.

As the nation waged war in landlocked Afghanistan and land-centric Iraq, the Navy strove to define their value to the nation in terms of the larger fight against terrorists and extremist philosophies. Without another "blue-water"[4] competitor challenging the U.S. Navy's dominance of the sea, the Navy began to understand that it needed a way to explain how naval power and presence provide global stability while advancing U.S. foreign policy aims. The tragic Indonesian tsunami and earthquake in December 2004 created an opportunity for the Navy to demonstrate how a fast, comprehensive, and compassionate HA/DR response can create avenues for increased positive public perception of the U.S. among average Indonesians as well as their government – helping foster cooperation between the U.S. and Indonesia. The Indonesian tsunami response in 2004-2005 and subsequent HA/DR responses in the U.S. Gulf Coast hurricane and in the Pakistani earthquake response that year helped to convert senior Navy leadership; they grasped the potential for Navy to play a critical, national role by providing HA/DR capabilities.[5] By 2007, *CS21* had enshrined HA/DR as one of Navy's six "Core Competencies," along with the more traditionally recognized competencies of Forward Presence, Sea Control, Power Projection, Maritime Security, and Deterrence.[6] The U.S. Navy has inherent capabilities to perform the HA/DR mission. For one, naval forces span the world as part of the U.S.'s global presence of bases and deployed

[4] "Blue water" is a term that means a fleet that is global in reach and operates in the open ocean, not close to the shoreline. The last blue water competitor for the U.S. Navy was the Soviet Union during the Cold War. Today's rising naval powers are still considered regionally focused and not capable of conducting sustained blue water operations.

[5] See http://www.navy.mil/navydata/leadership/quotes.asp?q=11&c=6 for quotes from Navy leadership on the maritime strategy before the CS21 strategy was signed. Scrolling to the bottom of the page reveals their thoughts on soft power in 2005.

[6] *CS21*, p. 12-14. – HA/DR was listed last among the six "Core Capabilities," which represents a realistic view (whether or not it was intentional) of HA/DR's importance. Its inclusion in such a high level document, however, does signify an increase of importance of HA/DR.

surface ships. Secondly, the surface forces have a mix of capabilities that have proven useful in HA/DR responses.

This thesis will discuss the policy case for U.S. Navy participation in HA/DR missions, the extent and results of naval surface forces involvement in HA/DR in the past six years, and the important capabilities naval surface forces provide during HA/DR missions and which surface ship platforms provide the best HA/DR capability mixes. While the Navy talks about HA/DR being a core competency, the paper will seek to understand if the Navy really intends to back up the soft power elements of the *CS21* strategy with direct acquisition funds to develop increased capabilities in HA/DR. Lastly, the thesis will examine policy implications of ensuring the U.S. Navy's surface force is able to respond effectively to HA/DR – that it has the right mix of capabilities now and in the futures. A hypothesis that the Navy has not considered fielding a fleet with sufficient HA/DR capabilities in the Navy's current 30-year shipbuilding plan will be examined. A point of clarification before going forward, the thesis will focus on surface force capabilities, meaning the ship platforms, both active and auxiliary units, as opposed to discussions about submarines and specific aviation platforms. For the purposes of this paper, a ship's capability to embark and/or support "x" number of helicopters will be the important variable measure; it will not be about the capabilities of the helicopter platform itself.

Chapter 1: Setting the Stage

1.1 - Definition of Humanitarian Assistance/Disaster Relief:

Providing a definition of HA/DR represents a useful exercise before embarking on the rest of the thesis discussion. The Navy issued a Tactical Memorandum (TACMEMO) in August 2005

on HA/DR Operations Planning.[7] In the glossary, the Navy provides several definitions for the various components of HA/DR. Using a Joint Publication as reference, "Foreign Humanitarian Assistance" (FHA) is explained as "programs conducted to relieve or reduce the results of natural or manmade disasters or other endemic conditions such as human pain, disease, hunger or privation," and that such missions are "limited in scope and duration."[8] Further, the TACMEMO, pulls directly from the Joint Publication defining "foreign disasters" as "acts of nature (such as a flood, drought, hurricane, earthquake, volcanic eruption, or epidemic), or an act of man (such as a riot, violence, civil strife, explosion, fire, or epidemic), which is, or threatens to be of sufficient severity and magnitude." "Foreign disaster relief' (FDR) is defined as "prompt aid that can be used to alleviate the suffering of foreign disaster victims. Normally it includes humanitarian services and transportation; the provision of food, clothing, medicine, beds and bedding; temporary shelter and housing; the furnishing of medical material and medical and technical personnel; and making repairs to essential services."[9] These definitions will help the reader understand how the U.S. Navy participates in HA/DR in the later discussions of capabilities and case studies.

The *Naval Operations Concepts 2010, Implementing the Maritime Strategy* document makes a further distinction in the HA/DR definition categorizing "Proactive" and "Reactive" HA/DR missions.[10] "Proactive" HA/DR includes regular engagement with foreign nations to

---

[7] Naval Warfare Development Command (NWDC) TACMEMO 3-07.6-05 "Humanitarian Assistance/Disaster Relief (HA/DR) Operations Planning," August 2005. Access online: http://www.au.af.mil/au/awc/awcgate/navy/tm_3-07-6-05_navy_ha&dr_ops_plng.pdf

[8] TACMEMO 3-07.6-05, Glossary-3. These definitions included in the Navy's TACMEMO pull directly from the Joint Publication 3-07.6. An update of JP 3-07.6 called JP 3-29 updated the FHA definition to read: Department of Defense activities, normally in support of the United States Agency for International Development or Department of State, conducted outside the United States, its territories, and possessions to relieve or reduce human suffering, disease, hunger, or privation." Found at: http://fhp.osd.mil/intlhealth/pdfs/JointPub3-29.pdf, Glossary-8.

[9] TACMEMO 3-07.6-05 Glossary-2 & Glossary-3.

[10] Department of the Navy and U.S. Coast Guard (ADM Gary Roughead, USN; Gen James T. Conway, USMC; and ADM Thad W. Allen, USCG), *Naval Operations Concepts 2010, Implementing the Maritime Strategy (NOC 2010),* June 2010, 47-48.

deliver medical treatment, train first responders, and complete selective public works projects. These proactive HA/DR missions fall mostly under the maritime partnership initiatives, which are regionally focused and work with the other services as well as non-governmental organizations (NGO) to increase their impact. One of the main goals of proactive HA/DR is to build partnership capacity, meaning the host nation will be better able to respond to disasters following U.S. delivered training and the relationships developed during the engagement will be critical to expedite relief efforts in the event of a disaster. In addition to brokering relationships and training host nation staff, the proactive HA/DR will help the U.S. change public perceptions of the U.S. military and foreign policy. Proactive HA/DR also assumes that the people who the U.S. helps with medical treatment, for example, will be more resistant to radical philosophies and less critical of U.S. foreign policy aims.[11]

Most people in the United States are more familiar with the Navy's reactive HA/DR capability. Reactive HA/DR grabs headlines as the public sees the Navy delivering food, water, and support to disaster areas. Whether it is floods in Pakistan, earthquakes in Haiti, or pulling U.S. citizens out of a conflict zone, the frequent publicity for the Navy has created goodwill across the world and an expectation of Navy support disaster areas.[12] As stated previously, the focus of this paper will be the capabilities required to do reactive HA/DR with the assumption being that the same capabilities used for reactive HA/DR would prove useful in most proactive HA/DR settings.

To illustrate the difference between the proactive and reactive HA/DR, one can examine a single deployment of the USS TARAWA (LHA 1) in 2005-2006. An amphibious assault ship/helicopter carrier designed to put embarked Marines ashore via helicopter and landing craft,

[11] *NOC 2010,* 47.
[12] *NOC 2010,* 48.

the LHA's organic capabilities make it a premier proactive and reactive HA/DR platform.[13] Even though TARAWA is the oldest LHA in the fleet, the southern Philippines provided an excellent opportunity for the TARAWA to engage the local populace. With Islam as the dominant religion in the southern Philippines, the population often feels estranged from the Catholic government of the North. This is due to geographic and logistical reasons as well as a constant low-grade separatist movement in the south that further affects investment from the northern government in the south. Therefore, in recent years, the southern Filipino population has been believed to be more susceptible to aiding radical Islamic groups. The U.S., in its larger "Global War on Terrorism" role, has done extensive outreach via proactive HA/DR in the southern Philippines.[14]

In August 2005, the TARAWA treated over 3,000 medical patients and delivered humanitarian supplies during a visit to a small island in the Sulu Archipelago called Tawi-Tawi.[15] Tawi-Tawi sits strategically between Malaysia's island of Borneo and the Philippines. This represented a potential maritime route for Malaysian Islamic extremists to transport weapons and trainers to the Islamic separatists in southern Philippines. The TARAWA teamed with the Armed Forces of Philippines (AFP) and NGOs to deliver the assistance. Many of the people of Tawi-Tawi had probably never seen a doctor, let alone a huge, 800 foot long U.S. naval ship, anchored off the shore of this tiny island in a forgotten part of the Pacific. Yet, this mighty warship, a symbol of ultimate American power and influence, used its landing craft to run doctors, Marines, NGOs, AFP servicemen, and sailors ashore to aid the inhabitants of Tawi-Tawi.

---

[13] Navy Fact File (LHA/LHD/LHA-R) http://www.navy.mil/navydata/fact_display.asp?cid=4200&tid=400&ct=4. Navy Fact File provides more detailed information about the LHA and all naval surface platforms. Additionally, much of the data about various surface platforms the author refers to come from professional knowledge from serving as a Surface Warfare qualified officer on active duty from 2000-2007 and reserve duty from 2007 to present.

[14] These are the author's observations. The author served as the Operations Officer onboard USNS GYST FRED W. STOCKHAM from July to October 2005 in the Southern Philippines. The author interacted directly with the Operations personnel from USS TARAWA to plan TARAWA's humanitarian assistance mission in Tawi-Tawi.

[15] USS TARAWA (LHA 1) Command History, http://www.uscarriers.net/lha1history.htm.

By mid-October, however, the TARAWA became involved with a massive reactive HA/DR mission in response to a devastating earthquake in Pakistan on October 8, 2005.[16] The TARAWA and her sister amphibious support ships in the Expeditionary Strike Group (ESG), provided logistical support, on loading and off loading supplies at Karachi, and flew extensive supply and search and rescue missions with embarked helicopters.[17] TARAWA's and the Navy's support came as a part of a larger Department of Defense (DoD) response. Relief efforts from the Army, Air Force, and Marine Corps proved significant. This combined DoD effort showed discernible results in Pakistanis perceptions of the United States. According to a poll conducted by the study group Terror Free Tomorrow (TFT) in November 2005, "Pakistanis with a favorable opinion of the United States have doubled from 23% in May 2005 to more than 46% in November, while the percentage of Pakistanis with very unfavorable views declined from 48% to 28% over the same period."[18] TFT credits the U.S. military response to the earthquake in October for the considerable change in public opinion because "78% of Pakistanis surveyed said that American aid has made them feel more favorable to the United States."[19] So, during one ship's seven-month deployment, one can understand what constitutes the policies of proactive and reactive HA/DR mean in practice.

1.2 - HA/DR in policy – A review of literature that helped shape the current policy

The Navy has demonstrated an ability to support U.S. foreign policy goals through HA/DR. This is clearly the case with the Indonesian tsunami response that will be discussed later. Around 2005, authors and Navy strategists began to link the Navy and execution of soft and smart

[16] TARAWA Command History.
[17] U.S. DoD, 2005 Year in Review, "When the Earth Shook" http://www.defense.gov/home/features/2006/2005yearinreview/article4.html
[18] Terror Free Tomorrow, "A Dramatic Change of Public Opinion In the Muslim World: Results from a New Poll in Pakistan," 2005, www.terrorfreetomorrow.org, 4.
[19] TFT, 4.

power goals by means of HA/DR and other naval missions such as international partnership building. So a worthy enterprise would be to take a quick look at what constitutes soft power, the primary thinkers, and the Navy's translation of theory into policy.

The primary architect behind the concept soft power is Joseph Nye. Nye comes from the neoliberal school of international relations, and wrote his seminal *Foreign Policy* piece in 1990 at the end of the Cold War. In his piece, Nye explains soft power is "when one country gets other countries to want what it wants."[20] Soft power relies on the economic, cultural, and diplomatic power of a country rather than the "hard" power of military force or threat of force. Soft power also puts a premium on a country's prestige and getting other countries to emulate the country's policies and culture. In the post-Cold War World, however, the military has largely become one of the most important pillars to exercising U.S. soft power in the world. In 1990, Nye wrote in the context of a military very much focused on hard power strategies for defeating the Warsaw Pact. The experience of the United States over the last two decades shows the limits of both soft and hard power. Nye reviewed those limitations in 2002 with his piece, "Limits of American Power" in the *Political Science Quarterly*.[21] In the writing, Nye counters the unilateralist urges of neo-conservatives like Charles Krauthammer, who believed that American power, especially hard power, knew few limits in the aftermath of 9/11, by outlining the dangers of those of over-reliance on hard power to achieve foreign policy aims.

Suzanne Nossel built upon Nye's critique of the neo-conservatives and introduces the concept of "smart power" in 2004 with an article in *Foreign Affairs.*[22] One of the key differences between Nossel's opinion and those of the liberal institutionalists, like Nye, was the concept of using the military as a key component of a smart power strategy. The military, she recognized,

[20] Joseph S. Nye, Jr., "Soft Power" *Foreign Policy*, No. 80, Twentieth Anniversary (Autumn, 1990), p. 166.
[21] Joseph S. Nye, Jr., "Limits of American Power." Political Science Quarterly, Vol. 117, No. 4 (Winter, 2002-2003), pp. 545-559
[22] Suzanne Nossel, "Smart Power" *Foreign Affairs,* Vol. 83, No. 2 (Mar. - Apr., 2004), pp. 131-142

had the organization, budget, and global reach to assist in humanitarian outreach and building goodwill in South America, Asia, and Africa. She tells progressives that, "renewed liberal internationalist strategy recognizes that military power and humanitarian endeavors can be mutually reinforcing."[23]

Nossel's concepts of smart power were further developed by researchers from the Center for Strategic and International Studies (CSIS). CSIS established a bi-partisan commission to examine the policy implications of applying smart power in 2006.[24] By 2007, they published a set of papers called the "CSIS Commission on Smart Power," with the commission being co-chaired by Joseph Nye and Richard Armitage.[25] The CSIS study on smart power explains in greater detail what Nossel conceptualized in 2004, which was essentially the U.S. needs to deploy a balance of soft and hard power. This meshing of hard and soft capabilities meant that the military would play a larger role in soft power execution, especially in the role of HA/DR. In fact, the CSIS report pointed to the 2004-2005 military HA/DR response to the tsunami in Indonesia and the large earthquake in Pakistan in 2005 as examples of military assets used for soft power aims to great effect for U.S. foreign policy goals.[26]

Not surprisingly, Navy leadership also studied the dramatic and well-publicized success story of their extraordinary efforts in HA/DR missions in Indonesia and Pakistan in 2004-2005. Already, the Navy had been moving toward a more international partnership, soft power strategy with initiatives such as the "1000-Ship Navy" and the Maritime Partnership Programs of the mid-2000s.[27] The Navy codified the shift towards smart power in the aforementioned October 2007

---

[23] Nossel, 138.
[24] CSIS, Commission on Smart Power, 1.
[25] Nye obviously saw the logic and the potential of using hard power assets for soft power aims, hence his involvement with the Smart Power Commission.
[26] CSIS, 9.
[27] Admiral Michael Mullen, "Commentary: We Can Not Do It Alone," *Honolulu Advertiser*, Oct. 06, 2006, accessed at http://www.navy.mil/navydata/cno/mullen/Honolulu_Advertiser_October_29_2006.pdf / Admiral Michael Mullen was the Chief of Naval Operations (CNO), the Navy's highest ranking officer, during the Pakistani earthquake

"A Cooperative Strategy for 21st Century Seapower" (CS21). The document represented a combined maritime strategy for the U.S. Navy, Marine Corps, and Coast Guard. While this was a significant step in a shared vision of the role of seapower, equally important was the strategy's definition of the large role that international partnerships and HA/DR will play for naval forces.[28]

The Navy's strategy in October 2007 clearly lays out a balance of soft and hard power capabilities and missions without ever mentioning the exact word "smart" or "soft power." This change was certainly not overlooked by national security and naval commentators. Several articles mention the marked shift outright. From the *Washington Post* on October 17, 2007 one finds the headline, "New Maritime Strategy to Focus on 'Soft Power'." [29] Later in the year, the *Christian Science Monitor* ran a story entitled, "U.S. Navy aims to flex 'soft power': Goodwill missions could become the Navy's chief strategy in the war on terror."[30] Other contemporary articles and blogs at the U.S. Naval Institute questioned the Navy's new strategy in terms of realistic expectations and the focus on soft power. Generally, however, most seemed supportive of the course plotted in the strategic plan. In fact, a survey of naval offices in *Navy Times* revealed that most officers support "soft power" goals for the U.S. military[31]

Another influential piece linking the U.S. Navy and concepts of smart power followed on the heels of the CS21 release from Robert D. Kaplan. Earlier in 2005 Kaplan had written that,

> In fact, there was no more suitable organization in the world for emergency assistance than the U.S. military, with its air and sealift capacity, and the ability of its nuclear carriers to

---

HA/DR efforts in 2005. His 1000-ship navy idea was changed in name, but one can certainly see the intellectual spirit behind the 1000-ship navy and HA/DR mission focus in the CS21 strategy, which he helped mold before becoming Chairman of the Joint Chiefs of Staff two months before CS21 was released in October 2007 under then CNO Admiral Gary Roughead.

[28] *CS21*, .

[29] Ann Scott Tyson, "New Maritime Strategy to Focus on 'Soft Power'", Washington Post, Oct. 17, 2007, accessed online on Oct. 31, 2010 at http://www.washingtonpost.com/wp-dyn/content/article/2007/10/17/AR2007101700536.html

[30] Gordon Lubold, "U.S. Navy aims to flex 'soft power': Goodwill missions could become the Navy's chief strategy in the war on terror." *Christian Science Monitor*, Dec. 27, 2007 accessed online on Oct. 31, 2010 at http://www.csmonitor.com/2007/1227/p02s01-usgn.html.

[31] Andrew Tilghman, "Survey: Officers favor 'soft power'," *Navy Times*, Sep 27, 2010, accessed online on Oct. 31, 2010 at http://www.navytimes.com/news/2010/09/military-officers-survey-iraq-afghanistan-soft-power-092510w/.

> reprocess seawater into hundreds of thousands of gallons of fresh drinking water. . . . The [Indonesian] tsunami relief effort demonstrated a navy's soft power. To wit, [an aircraft] carrier strike group offered an impact on land that was out of proportion to its small, nonthreatening footprint, located as it was some miles offshore.[32]

By the November 2007 issue of *The Atlantic*, Kaplan spoke of "America's Elegant Decline." Kaplan argued that only an active and globally present Navy could secure the U.S.'s great power status. He declared that the concept of "hulls in the water" will be more important in the 21st century than "boots on the ground."[33] These "hulls in the water" would perform a variety of missions, from "disaster relief" to "tracking Chinese subs."[34] As with CS21, Kaplan firmly placed the soft power HA/DR mission as one of the key areas of engagement performed by the U.S. Navy.

In the years since CS21, the Defense establishment has enshrined HA/DR in its strategic documents. The 2010 Quadrennial Defense Review (QDR) conducted by the Department of Defense mentions humanitarian assistance and disaster relief several times: four times in discussing building international relationships, once in regards to U.S. interagency cooperation, and once when discussing potential impacts of climate change.[35] By 2011, HA/DR was firmly entrenched as a core capability of the U.S. military policy in the National Military Strategy (NMS). The NMS even had a section entitled "Theater Security Cooperation and Humanitarian Assistance" declaring that,

> Humanitarian assistance and disaster relief activities employ the Joint Force to address partner needs and sometimes provide opportunities to build confidence and trust between erstwhile adversaries. They also help us gain and maintain access and

---

[32] Robert Kaplan., *Hog pilots, blue water grunts : the American military in the air, at sea, and on the ground* (New York : Random House, 2007), 95.

[33] Robert Kaplan, "America's Elegant Decline," *The Atlantic*, Nov 2007, accessed online on Oct. 31, 2010 at http://www.theatlantic.com/magazine/archive/2007/11/america-8217-s-elegant-decline/6344/.

[34] Kaplan, online.

[35] Department of Defense, *Quadrennial Defense Review Report*, February 2010. The climate change mention is particularly interesting for DoD policy. Addressing climate change in the 2010 QDR was required by Congress in the 2008 National Defense Authorization Act (NDAA). The QDR stated that "climate change along does not cause conflict, [but] it may as act as an accelerant of instability or conflict. . . . In addition, extreme weather events may lead to increased demands for defense support to civil authorities for humanitarian assistance or disaster response both within the United States and overseas (QDR, p. 85)." This represented an interesting shift for DoD to link climate change to increased operational tempo for HA/DR missions.

relationships that support our broader national interests.[36]

Clearly, the military, and the Navy in particular, must treat the HA/DR skill set with seriousness, since military leadership has written the very importance of HA/DR into critical strategic and policy documents. One can see how Nye's soft and smart power theories have gained popularity in a military that knows it must succeed on multiple fronts, not just in combat, but also in public perception. Additionally, one only has to look at Navy's recent recruiting campaign, "A Global Force for Good," to see how integral a role HA/DR plays in recruiting. The commercial shows scenes of ships and aircraft as well as images of Navy personnel in a flooded area conducting search and rescue. Further, on the recruiting website, the Navy explains what constitutes a "Global Force for Good" by partly mentioning that, "[the Navy is] a force that readily answers the need for humanitarian assistance and disaster relief anywhere, anytime – to help American citizens and citizens of the world."[37]

Of course, just because HA/DR missions featured prominently in the Navy's "Global Force for Good" campaign and strategic documents, does not mean that everyone agrees that the Navy should engage in HA/DR efforts. Most critics of the elevation of HA/DR to a core capability contend that it takes away from warfighting abilities of the naval force for traditional fleet engagements and power projections. Additionally, they posit that other governmental organizations (U.S. State Department, USAID, etc) should take leading roles in HA/DR, not the Navy.[38] Senior military and civilian leadership, however, have clearly argued in policy and practice that HA/DR mission are key to U.S. foreign engagement and presence opportunities. As such, the remainder of the thesis will focus on the recent cases the Navy has conducted HA/DR,

[36] Michael G.Mullen Chairman of the Joint Chiefs of Staff (CJCS), *The National Military Strategy of the United States of America 2011: Redefining America's Military Leadership,* Feb. 08, 2011, 17. Admiral Mullen, CJCS in 2011 was also very influential in the development of the Navy's CS21 – Mullen served as Chief of Naval Operations, the Navy's highest position, until mid-2007 – therefore, it flows that HA/DR features proximately in

[37] Navy Recruiting Website main page, http://www.navy.com/navy/about/gffg/.

[38] Robert J. Carr, "The Mission is Warfighting, Not Relief, *USNI Proceedings Magazine*, December 2010 Vol. 136/12/1, 294.

the key capabilities used, and the procurement implications for the Navy's future.

Chapter 2. Case Studies in Navy Reactive HA/DR Responses

As this thesis is being written, the U.S. is engaged in a dramatic HA/DR response in Japan's tsunami devastated northeast coast. An aircraft carrier and an Amphibious Readiness Group (ARG) have deployed off the coast of Japan to provide a variety of services including supplies via helicopter and landing craft and search and rescue missions. The Navy has also supplied sea water cooling pumps to the Japanese power company in an effort to avert a nuclear meltdown at the Fukushima Dai-Ichi nuclear power plant.[39] One can imagine that the people of Japan will appreciate the herculean efforts expended by the U.S. servicemen and women to provide essential services in the wake of the horrific tsunami. One could also speculate that the Navy's response might help solidify the U.S.'s critical, strategic position in Japan. Japan has long been called the U.S.'s "unsinkable aircraft carrier" in Asia, and the relationship with Japan will likely grow more important as Asian countries continue to develop economically and militarily.[40] Already, people have wondered if the Navy's quick, massive, and compassionate response might help shift Japanese attitudes of the American military presence in Japan, perhaps solidifying the relationship for a new generation of Japanese.[41] So let us examine the recent history of naval intervention in reactive HA/DR situations to understand the naval platforms used in those events and the capabilities found most useful to relief efforts.

Prior to the tsunami relief efforts in Indonesia and beyond, U.S. Naval forces did not engage in many large scale, reactive HA/DR missions cased by natural disasters. Throughout the

[39] Commander, Naval Forces Japan Public Affairs, "US Navy Provides Pumps to Assist in Reactor Cooling Effort," March 18, 2011, http://www.c7f.navy.mil/news/2011/03-march/040.htm

[40] Purnendra Jain and John Bruni, *Asia Times Online*, "America's 'unsinkable aircraft carriers'," June 4, 2003, http://www.atimes.com/atimes/Japan/EF04Dh02.html

[41] Daniel Kliman, *Disaster in Japan: Nuclear Energy, the Economy and the U.S.-Japan Alliance*, March 18, 2011, accessed at http://www.cnas.org/files/documents/publications/CNAS_DisasterInJapan_policybrief.pdf, 2.

1990s and early 2000's HA/DR to the Navy meant more limited actions like evacuations of civilian personnel or supporting investigations on shore.[42] Any reaction to natural disasters was usually one or two ships, not the massive movement of ships and material America has come to expect.

While post-2005 there have been systematic deployments for proactive HA/DR, especially in the Southern, Pacific, and Africa Partnership Programs, this paper will concentrate on several high-profile, reactive HA/DR responses and the capabilities employed by the surface fleet in those more complex situations. The assumption is that the capabilities for the reactive HA/DR responses would still be useful in proactive HA/DR missions. Table 1 (below) shows the major reactive HA/DR responses since 2005. For the purposes of this thesis, definition of "major" consists of more than one major surface combatant committed to relief efforts for a specific natural disaster – weather (hurricane, flooding) or plate tectonics (earthquake/tsunami) related. As one will see in Table 1, the Navy has averaged approximately two major reactive HA/DR responses a year, further demonstrating that HA/DR has indeed become one of the Navy's "core capabilities" as articulated in *CS21*. A detailed look at some of the major reactive HA/DR missions will follow Table 1.

[42] Navy Program Guide 2009, *Sea Power for a new Era: Appendix A: Navy-Marine Corps Crisis Response and Combat Actions*, 2009, accessed at http://www.navy.mil/navydata/policy/seapower/sne09/Navy%20Program%20Guide%202009.pdf, 155-167.

Reactive HA/DR Event Description			Naval Surface Forces Involved								Capabilities Used									
Major Geographic Event Location	Type of Disaster	Year	CVN (Aircraft Carrier)	LHA/LHD (Big Deck Amphib)	LPD/LSD (Amphibious Ships)	CRUDES (CG/DDG)	Small Surface (FFG/LCS)	HSV (High Speed Vessel)	USNS Hospital Ship	USNS Support (Supply/MPF Ships)	Helicopters (Supply delivery and Search & Rescue)	Surge Berthing	Medical Facilities	Command & Control	Load/Offload Supplies	Shipboard Potable H2O	Humanitarian Supplies	Small Craft/Boats	Draft	Speed to Station
Indonesia	Tsunami/ Earthquake	2004-2005	✓	✓	✓	✓	✓	✓	✓	✓	✓+	✓	✓	✓	✓	✓+	✓	✓	✓	✓+
U.S. Gulf Coast	Hurricane	2005	✓	✓	✓		✓	✓	✓	✓	✓+	✓	✓+		✓	✓	✓	✓	✓	✓
Pakistan	Earthquake	2005-2006		✓	✓	✓					✓+			✓	✓+		✓			
Philippines	Mudslides	2006		✓	✓	✓					✓						✓			
Nicaragua	Hurricane	2007		✓	✓		✓				✓						✓			
Bangladesh	Tropical Cyclone	2007		✓							✓						✓			
Philippines	Typhoon	2008	✓							✓	✓					✓	✓	✓		
Philippines	Tropical Storm	2009			✓						✓		✓				✓	✓		
Indonesia	Earthquake	2009			✓	✓					✓						✓			
Haiti	Earthquake	2010	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓+	✓	✓+	✓+	✓+	✓	✓+	✓+
Pakistan	Flooding	2010		✓	✓					✓	✓+						✓			
Japan	Tsunami/ Earthquake	2011	✓	✓	✓	✓	✓			✓	✓+	✓	✓+	✓	✓+	✓+	✓+	✓	✓	✓

Table 1. Major reactive HA/DR responses 2005-2011 with the surface ship platforms involved and the capabilities used or proven useful.[43]

[43] Note on Table 1: A "✓" signifies that the platform or capability was used in the relief efforts. A "✓+" refers to a capability that proved essential to the particular relief effort. Table 1 was pulled together from various sources including the Navy Program Guide 2009's Appendix A, press releases on Navy, DoD, and Combatant Command websites, as well as news reporting, books, and articles in numerous publications. On several occasions, multiple sources were required to confirm a platform's participation in an event. A check only confirms a platform's presence in an event. In some cases, like the Philippines tropical storm in 2009 there were three separate LPD/LSD platforms involved, however, during the Philippines typhoon in 2008 only one CVN participated, with support from multiple USNS supply ships. Acronym list included in Appendix A. Also, for the capabilities used, the checks are for capabilities that were either stated in articles and firsthand accounts or inferred through the author's experience with naval operations. The definitions of the capabilities come later in the thesis. Additionally, one thing to note is that there is only one HSV and two hospital ships.

2.1 – The Navy's First Major Reactive HA/DR Response Indonesia 2004-2005

The earthquake and resulting tsunami on December 26, 2004 off the coast of Sumatra, Indonesia created a massive human tragedy in South Asia. The tsunami, however, also created a "sea change" in U.S. Navy thought about the use of its forces in the Post 9/11 world by demonstrating the importance of soft power missions. After the initial assessment of the damage caused by the tsunami, the U.S. began Operation Unified Assistance (OUA) to provide relief to the South and Southeast Asian community. While details of the size and scope of the destruction remained unclear in the first days, by December 28th U.S. Pacific Command (PACOM) had ordered the nuclear powered aircraft carrier, the USS ABRAHAM LINCOLN (CVN 72), and her Carrier Strike Group (CSG)[44] to make way from Hong Kong to Indonesia. The LINCOLN used its impressive speed (likely maintaining a speed of 30+ knots) to cover the approximately 2100 nautical miles[45] from Hong Kong to Banda Aceh, Indonesia, the closest area to the earthquake, in less than four days - arriving on January 1, 2005.[46] In addition to the LINCOLN, the USS BONHOMME RICHARD (LHD 6) Expeditionary Strike Group (ESG,) comprised of amphibious assault and support ships, left Guam on December 30th heading for Indonesia. Interesting to note, the ESG covered over 3, 000 nm in their journey from Guam, but the LHD's top speed of only 24 knots meant that the LINCOLN was the main support until the ESG arrived on January 7th.[47] By

[44] A Carrier Strike Group (CSG) is a group of ships (cruisers, destroyers, supply ships, etc) that deploy with the aircraft carrier (CVN) – the CVN being the "centerpiece." Similarly, the Expeditionary Strike Group (ESG) is like a CSG but with a "Big Deck" Amphibious Assault Ship (an LHA or LHD) as the centerpiece. See http://www.navy.mil/navydata/ships/carriers/powerhouse/cvbg.asp for more information about CSG's and http://www.navy.mil/navydata/navy_legacy_hr.asp?id=147 for more info on ESG's.

[45] A nautical mile is a measure of distance and is equivalent to 1. 15 miles. A knot is a measure of speed and is equivalent to 1.15 miles per hour.

[46] CAPT Lawrence Burt, "Carrier Air Wing Two: Surge Deployment & Operation Unified Assistance" PowerPoint Briefing obtained in open internet search, accessed at http://www.nps.edu/Academics/Institutes/Cebrowski/Docs/Burt%20BRIEFING1.ppt, 25.

[47] Elleman, Appendix.

January 12, the U.S. had over 25 ships in direct support of the reactive HA/DR mission in Southeast Asia.[48]

These 25 ships provided a "sea base" for operations ashore. Due to the devastation wrought by the tsunami, the Indonesia military could not gain easy access to Banda Aceh. The tsunami had destroyed the main coastal road and rendered 95 bridges inoperable.[49] Having those 25 platforms at sea enabled the Navy to assist ashore. The sea base consisted of all varieties of ships, including the aircraft carrier (CVN), the "big deck" amphibious carriers (LHA/LHD), amphibious landing and dock ships (LSD/LPD), cruisers (CG), destroyers (DDG), frigates (FFG), high speed vessels (HSV), hospital ships, and supply ships. This sea base showed how Kaplan's "hulls in the water" idea is critical. As Bruce Elleman, who wrote the definitive account of the U.S. Navy's response in OUA called *Waves of Hope*, clearly stated, "the U.S. Navy's ability to remain offshore of Aceh on sea bases decreased the American footprint, reduced friction [with the locals], and so greatly facilitated achieving the mission's objectives."[50] Of course, sustaining these ships at sea required dedicated logistics support from the Military Sealift Command's (MSC) fleet of oilers and cargo ships. MSC's ships provided the ships at sea with fuel and food as well as humanitarian supplies for delivery ashore. This enabled constant on station time for the naval assets; no ship worried about having to pull into port – the replenishment at sea proved sufficient.[51] While getting an airfield operational in Aceh represented a critical step for bringing in U.S. Air Force and Navy cargo planes loaded with supplies, only by helicopter transport could the supplies reach out beyond the airport. The sea base sustained, fueled, fixed, and housed all of those helicopters for weeks. Even the smaller platforms like the cruisers and destroyers played a role. They acted as lily pads for the helicopters to go back over the water, refuel on the cruiser or

[48] Elleman, 27.
[49] Burt, 9 & 22. See also discussion in Elleman, vii.
[50] Elleman, 38.
[51] Elleman, 43-44.

destroyer, and return to delivering aid or evacuating the wounded.[52] With the sea base established off the coast of Indonesia, one can examine the other capabilities the Navy found particularly useful in the tsunami response.

Then Secretary of State, and former CJCS, Colin Powell declared on January 5th that in Indonesia, "[h]elicopters are invaluable, especially helicopters coming in from the sea, where they can be refueled and resupplied out on our carriers, and are not taking up space at airfields or putting a logistics base at airfields." Indeed, the helicopter was "king" of the relief effort in Indonesia. The LINCOLN steamed into Aceh fortuitously with an enhanced helicopter capability as a result of an embarked anti-submarine warfare (ASW) helicopter squadron. The ASW helicopters had deployed with LINCOLN as an experiment replacement for the fixed-wing S-3 Viking anti-submarine jet aircraft. The test case proved essential as the LINCOLN Carrier Strike Group (CSG) arrived off of the coast with 17 helicopters to assist in HA/DR.[53] The increased number of helicopters gave the LINCOLN the absolute best tool to use in the tsunami ridden landscape, especially during the initial response. To contrast with the LINCOLN's capabilities, the Indonesian government had, "only two helicopters in Sumatra" in the initial aftermath and limited access via land due to the damaged roads.[54] The LINCOLN's helicopters were vital to conducting search and rescue missions, supply delivery, and medical evacuations.

Yet, even with 17 helicopters operating continuously, LINCOLN struggled to keep up with demand and had to focus on medical evacuations and essential supplies. It was not until the arrival of the BONHOMME RICHARD that OUA could focus on efficient supply dispersal. The "Big Deck Amphib," BONHOMME RICHARD provided 25 more helicopters to the effort.

---

[52] This information obtained through the author's own conversations with helicopter pilots from the LINCOLN. The author has worked with several pilots who flew missions in and out of Aceh during 2005.
[53] Burt, 5. See also discussion in Elleman, 56.
[54] Denis D. Gray, "U.S. choppers find remote survivors," *Washington Times*, January 4, 2005, accessed at http://www.washingtontimes.com/news/2005/jan/4/20050104-120818-1368r/?page=all#pagebreak.

Furthermore, her helicopters were larger and had more range than the LINCOLN's ASW helicopters.[55] The BONHOMME RICHARD's helicopters were designed specifically for transferring embarked Marines and their equipment from sea to shore. Therefore, they added incredible lift capacity to the relief effort.

Additionally, the ESG and the BONHOMME RICHARD also brought the landing craft capability. The U.S.'s amphibious ships have a well-deck in their stern where hovercraft, like the fast landing craft air cushion (LCAC), and other large landing craft (LCM/LCU) are housed. The Marines use the LCAC, LCM, and LCU for transporting troops and heavy equipment quickly ashore. One can only imagine that planners during OUA recognized the incredible capabilities that the amphibious ships brought with their embarked Marine Expeditionary Unit's (MEU) gear. There were, however, political and cultural sensitivities that had to be overcome before the Navy could use this equipment to ferry humanitarian supplies ashore. Elleman explains in a passage that highlights that sometimes there are concerns in a HA/DR situation about the Americans bringing *too* much capability,

> [T]he Indonesian military had its own concerns about plans to land Marines from *Bonhomme Richard* [LHD-6]. Positioned off the city of Meulaboh, where only several thousand residents had survived out of an original population of sixty thousand, this ship had landing craft ready to put about a thousand Marines ashore. This movement was delayed, however, because it might appear to be an invasion. Aceh Province had been under the control of the Indonesian military, and it was thought that televised images of U.S. landing craft heading for the Acehnese coast "could touch a raw nerve with the proud and suspicious Indonesian military."
>
> Finally, on 10 January 2005, a U.S. Navy LCAC—air-cushion landing craft—went ashore with thirty pallets of food and water. Only a few dozen personnel on *Bonhomme Richard* were allowed to go ashore each day. Also, instead of driving vehicles themselves to deliver aid—and risking traffic accidents that might spark anti-American anger, as had happened in places like South Korea—the Marines left final distribution of the supplies mainly to the Indonesian military.[56]

The landing craft had provided a critical capability in support of the helicopter operations already in progress.

[55] Elleman, 56.
[56] Elleman, 38.

Supply ships, with their vast stores of food and essentials, simply transferred humanitarian supplies over for the sea base to the amphibious ships, which in turn delivered large quantities ashore with their organic landing craft. The Military Sealift Command (MSC) which operates these supply vessels, brought in an assortment of different ships to supply both the sea base and relief efforts ashore. Thankfully, the MSC fields and deploys a vast fleet of prepositioned ships with supplies, normally reserved for warfare. Additionally, the MSC has a steady stream of oilers underway in the typical deployment route. These oilers provide support to Navy ships transiting to and from the Arabian Gulf or Pacific areas. Also, interestingly, MSC scrambled the high speed vessel, HSV-2 SWIFT, from Ingleside, Texas on January 3rd after loading it with medical and humanitarian supplies. Due to its high speed capability it arrived in Singapore on January 30th to transfer supplies to the hospital ship USNS MERCY. MERCY had left San Diego on January 8th as part of a presidential decision.[57] Of course, illustrative of the importance of speed, the HSV was able to arrive at the same time as the slower MERCY even with HSV having to travel from the U.S. Gulf Coast and stopping in Pearl Harbor for a brief port visit.[58]

The LINCOLN's medical facilities were also important in the early days of the response when her helicopters performed up to 45 medical evacuations a day from Aceh. By January 10, however, the number of evacuations had dropped to below five a day, demonstrating how typically the HA/DR mission shifts from immediate medical attention to sustained supply support. Because LINCOLN arrived on scene first, she had to deal with the majority of the medical cases. Thankfully, because the ship houses over 5,000 Sailors, they had doctors, nurses, and corpsman onboard to deliver direct aid to Indonesians. Additionally, with the arrival of the ESG, the OUA force significantly increased the medical capacity both at sea and ashore. Finally, however, the

[57] Elleman, 80.
[58] *Navy News Service – Pictures* accessed at http://www.navy.mil/search/photolist.asp with search term "HSV tsunami 2005" – pictures with captions detail HSV's journey and support to OUA.

Executive decision to send the MERCY signaled the U.S.'s political will to sustain HA/DR efforts. The slow moving MERCY, with a top speed of 20 knots, would not reach Banda Aceh until February. The LINCOLN CSG and BONHOMME RICHARD ESG had addressed most of the immediate medical needs by the time MERCY arrived. The symbolism, however, and the valuable aid that MERCY provided in February and March to tend to the entire spectrum of medical needs in the Aceh people demonstrated the resolve of the U.S. to the Indonesians and the world. In all, MERCY treated over 9,500 patients from February to June - an amazing capability used effectively.[59]

Potable water generating capability was one of the key supplies organic to the LINCOLN. LINCOLN's crew devised an ingenious system to fill "five-gallon jugs of fresh water" at a rate of 800 jugs per hour, just using the LINCOLN's own fresh-water generation capability. Those jugs were then delivered to shore via helicopter.[60] MERCY also brought significant water generating capabilities of 300,000 gallons per day with a "1.2 million gallon holding capacity."[61]

With dozens of helicopters in the air simultaneously, dozens of U.S. and international ships sailing close together, and a constantly evolving situation both operationally and diplomatically, the LINCOLN performed much of the command and control (C2) functions. The HA/DR response highlighted some gaps in the ability to communicate effectively. The LINCOLN discovered challenges associated with classifying materials while working with international partners as well as technical challenges associated with communicating across a wide and

[59] Elleman, 79-86.
[60] Elleman, 44. On Elleman 94 he makes the astute point one cannot "air drop" water. Therefore, the helicopter again was the perfect platform to carefully delivering life sustaining water as well as other humanitarian supplies. Plus, the helicopter crews assisted in coordinating distribution of supplies to the locals and/or the military. They could jump out of the helicopter and interact with the locals – something that an air drop lacks.
[61] Elleman, 79.

dispersed area. Yet, the LINCOLN soon established a communications regime, which aided in the successful OUA HA/DR operation.[62]

OUA contributed to an improved relationship with the Islamic majority Indonesia, which had suffered in the previous years. The Terror Free Tomorrow poll in February saw significant increases in Indonesian favorable public opinion towards the U.S. as a result of the U.S.'s HA/DR efforts. Moreover, 75% of Indonesians also believed that the U.S. was "doing enough" to help tsunami victims.[63] This could be interpreted as a vote of confidence of the Navy's response in OUA. Beyond the public sphere, in diplomatic terms operating closely with the Indonesian military and government during the HA/DR response brought the two countries together, which was important to the U.S. In short order, the U.S. had reversed a military supplies embargo against Indonesia, and by May 2005 President Bush expressed interest in resuming "normal military relations." The thaw continued as the working relationship forged in the heady days of OUA evolved. In June 2006, then Secretary of the Navy Donald Winter declared, "[The U.S.] have seen significantly positive impacts in Indonesia, Pakistan and Horn of Africa as a direct result of our and other nations' humanitarian assistance and disaster relief."[64]

2.2 – Other Reactive HA/DR Missions post OUA and Findings

Pakistan's earthquake in 2005 represented another major reactive HA/DR response for the Navy in the wake of both the Katrina Response and Operation Unified Assistance earlier in the year. The location of the earthquake and the relatively close proximity to land forces in central Asia (Afghanistan, etc) made this response different than OUA.[65] Even with the differences, DoD

[62] Elleman, 69-72.
[63] Terror Free Tomorrow, *A Major Change of Public Opinion In the Muslim World: Results from a New Poll of Indonesian*, 2005, accessed at www.terrorfreetomorrow.org, 1-7.
[64] Elleman, 101-103.
[65] For a more information about the DoD response access the articles in the http://www.defense.gov/home/features/2005/pakistan/ website. These articles helped inform this section.

tapped the Navy's Expedition Strike Group One's (ESG 1) Commander and staff to lead the joint effort in delivering aid to Pakistan, placing ESG 1's Rear Admiral Michael A. Lefever in charge.[66] Despite the disaster occurring a considerable distance inland, the Navy provided immediate assistance in the form of helicopter support from an LHA stationed off the Pakistani coast. The Navy provided further support by loading heavy machinery and supplies from a SEABEE construction battalion stationed in Bahrain onto a LSD and LPD for transport and eventual offload in Pakistan.[67] The onload and offload capability featured prominently in the Pakistani response. Yet, helicopters operating from sea (and over land) again provided access to remote areas to deliver supplies and medical attention. As stated earlier in the thesis, the U.S.'s efforts helped demonstrate the resolve to aid a key ally in the fight against radical Islamic terrorism.[68]

In 2010, Navy again provided critical first responder assistance to disastrous floods in Pakistan's interior. The Navy played an important role with amphibious assault ships (LHA) supporting helicopter operations at the center of the efforts acting as the sea base. MSC supply ships provided humanitarian supplies and the LHA provided the helicopter support.[69]

Reactive HA/DR response occurs commonly now as one can see in Table 1. Most of the time, the Navy's level of support depends on the available forces and the level of destruction.

---

[66] Justin T. Cole, "Lefever, Disaster Assistance Center Pakistan Honored At Embassy," *Navy.mil Official Website*, Sept. 9, 2006, accessed at http://www.navy.mil/search/display.asp?story_id=25725.
[67] Cassandra Thompson, "USS Pearl Harbor, Seabees Bringing Relief Equipment to Pakistan," *Navy News Stand*, Oct. 14, 2005, accessed at http://www.globalsecurity.org/military/library/news/2005/10/mil-051014-nns01.htm.
[68] Terror Free Tomorrow – *Pakistan* poll. Again, this report can be found at www.terrorfreetomorrow.org and provides in depth statistics of how U.S. aid contributed to a shift in public perception of the United States. It should be noted, however, that no event exists in a vacuum. So just because the U.S. succeeds in improving its public perception in Pakistan though HA/DR aid in 2005 does not mean that repeated drone attacks on Pakistani soil by the U.S. and other U.S. policies in Iraq and Afghanistan cannot turn public opinion back against the U.S.
[69] Kim Dixon, "Lewis and Clark Keeps Pakistan Flood Response on Track" *MSC Press Release*, September 14, 2010, accessed at http://www.navy.mil/search/display.asp?story_id=55940. For other Pakistani flood info that informed Table 1 see http://www.defense.gov/home/features/2010/0810_pakistan/.

Whereas the earthquake in Haiti got an "all hands on deck" response of all types of ships,[70] including an aircraft carrier, a tropical storm in Philippines received limited (yet important) support from several LPD/LSD amphibious ships, but no larger ships or MSC supply ship assistance.[71]

One thing that becomes clear from Table 1 is that amphibious ships form the backbone of HA/DR response support, only the Philippine Typhoon response in 2008 did not have a LHA, LHD, LSD, or LPD present. The most important capability is the helicopter – the helicopter provides access to remote areas and allows the U.S. to maintain a lower footprint on ground in situations where a U.S. military presence could be seen with trepidation. Additionally, MSC supply ships are crucial to sustaining operations for any length of time. They enable the sea base and facilitate relief efforts with their large supply stores. Also, in Figure 1 one notices that location plays a key role as well. The major reactive HA/DR responses events that have elicited a naval response have been along typical deployment routes. Additionally, proximity to U.S. Navy fleet concentration areas and bases also appear to factor heavily. Figure 1 illustrates this

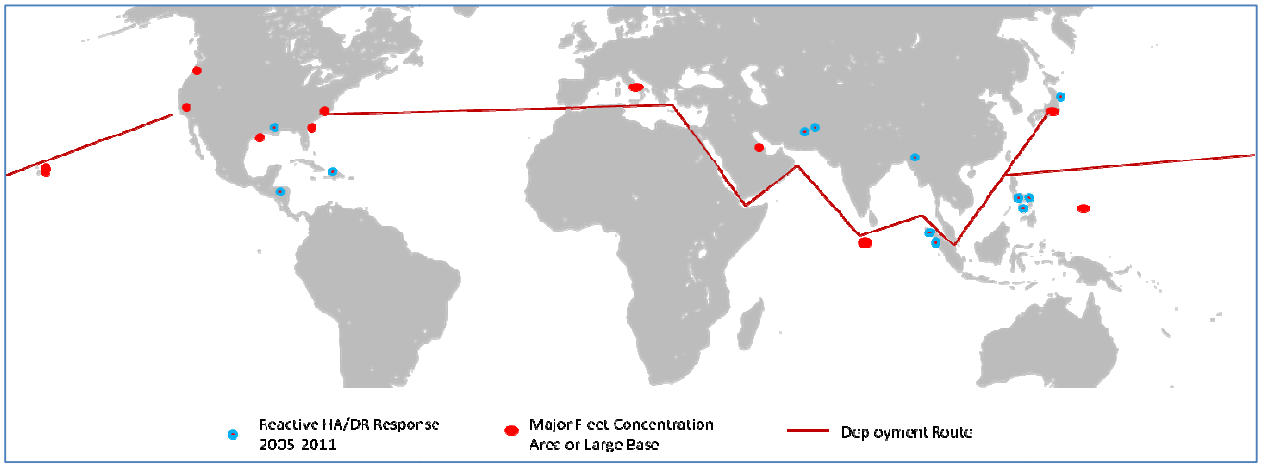

Figure 1. Typical U.S. Navy Deployment Routes, Reactive HA/DR Responses 2005-2011, and Fleet Concentration Areas/Major Bases

[70]U.S. Southern Command (SOUTHCOM), **"**Narrative History of Operation Unified Response," May 25, 2010, accessed at http://www.southcom.mil/appssc/factFilesLarge.php?id=138.

Chapter 3: Analysis of naval surface force capabilities necessary for HA/DR

As highlighted in the case studies above, certain surface force capabilities have more utility in HA/DR missions. As a core competency of the Navy, the Navy must understand what those capabilities are and what surface platforms have the best mix of capabilities

3.1 - The 10 Equipment Capabilities essential to conduct HA/DR:

- Helicopter capacity: The most important capability as demonstrated in multiple HA/DR responses. Operating from naval forces off the coast, the helicopter's low footprint makes it a palatable option for delivering aid in almost any circumstance.
- Surge Berthing: The ability to house additional people to support HA/DR efforts. For some cases this would be non-governmental organizations (NGO's) or other U.S. government organizations like USAID.
- Medical facilities: These are onboard ship facilities or the ability to provide medical treatment ashore.
- Command and Control: Communications enable ships to relay information to the Combatant Commander, other ships, aircraft, and diplomats ashore to de-conflict potential issues and efficiently distribute aid.
- Load and offload supplies: Being able to quickly load and offload supplies plays an important role. Several ships have unique capabilities to load and offload supplies in port, provided port facilities are still functioning in the disaster area.
- Shipboard Potable Water (H_2O): Ships at sea make fresh water from seawater using a variety of methods including reverse osmosis (RO) and evaporation. The ability to produce fresh water at sea is important to most relief efforts. Bottled water is more expensive to store

and transport into the area. Being able to use the ship's organic fresh water saves time and money in a HA/DR situation.

- Humanitarian Supplies: These supplies provided a lifeline in the initial phases of the HA/DR response. Tents, portable RO units, food, blankets, etc can be stored on ships or loaded in port for transfer to the HA/DR area.

- Small Boats/Landing Craft: These are particularly useful in any HA/DR situation. In Haiti in 2010 for instance, a DDG's small boat was able to scout out the pier facilities and report on their status back to the Joint Task Force. The landing craft discussed in the case study can transfer heavy supplies quickly and without port facilities.

- Draft: This is the depth of the ship's hull underneath the waterline. The disasters affect port facilities and transit capabilities on land, so ships with the ability of being closer to land cuts down on transit time for helicopters, small boats, landing craft, etc coming from sea to land. In order to be closer to shore usually requires a shallow draft depending on the continental shelf drop off.

- Speed to station: Natural disasters usually occur with little notice and cause extensive damage quickly. Quicker response times prove critical as first few days of a disaster are crucial to locate survivors and treat the seriously wounded.

	Helicopters (Supply delivery and Search & Rescue)	Surge Berthing	Medical Facilities	Command & Control	Load/Offload Supplies	Shipboard Potable H20	Humanitarian Supplies	Small Boats / Landing Craft	Draft	Speed to station
Weighted Capability (1-5)[72]	5	1	3	1	3	2	3	4	1	3
CVN	High	High	Med	High	Med	High	Med	Med	Low	High
LHA/LHD	High	High	Med	High	High	High	Med	High	Med	Low
LPD/LSD	Med	Med	Med	Med	High	Med	Med	High	Med	Low
CG, DDG	Low	Low	Low	Med	Low	Low	Low	Low	Low	Med
LCS	Low	Low	Low	Low	Low	Low	Low	Low	High	High
JHSV	Low	Med	Low	Low	High	Low	High	Low	High	High
Hospital Ships	Low	High	High	Low	Med	High	Med	Low	Low	Low
Supply Ships	Low	Low	Low	Low	High	Low	High	Low	Low	Low

Table 2. The Future Surface Force Relative HA/DR Capabilities Matrix[73]

Platform	Total HA/DR Capability Score
CVN	63
LHA/LHD	65
LPD/LSD	56
CG, DDG	30
LCS	34
JHSV	47
Hospital Ships	44
Supply Ships	38

Table 3. The Total HA/DR Capability Score[74]

[72] Weight of Capability is based on research done in conjunction for Table 1. The author reviewed all the listed HA/DR responses in Table 1 and used this to determine the weight applied to the particular capability. The scale is a 1-5 scale with 5 being the most important to a HA/DR response and 1 being of use in an HA/DR response.
[73] See Appendix B for description of the ratings of "High, Medium, and Low."
[74] The Total Score was derived by multiplying the High, Medium, and Low (3, 2, 1) scores as described in Appendix B with the Weighted Capability Score, and then added through the row to obtain the "Total Score."

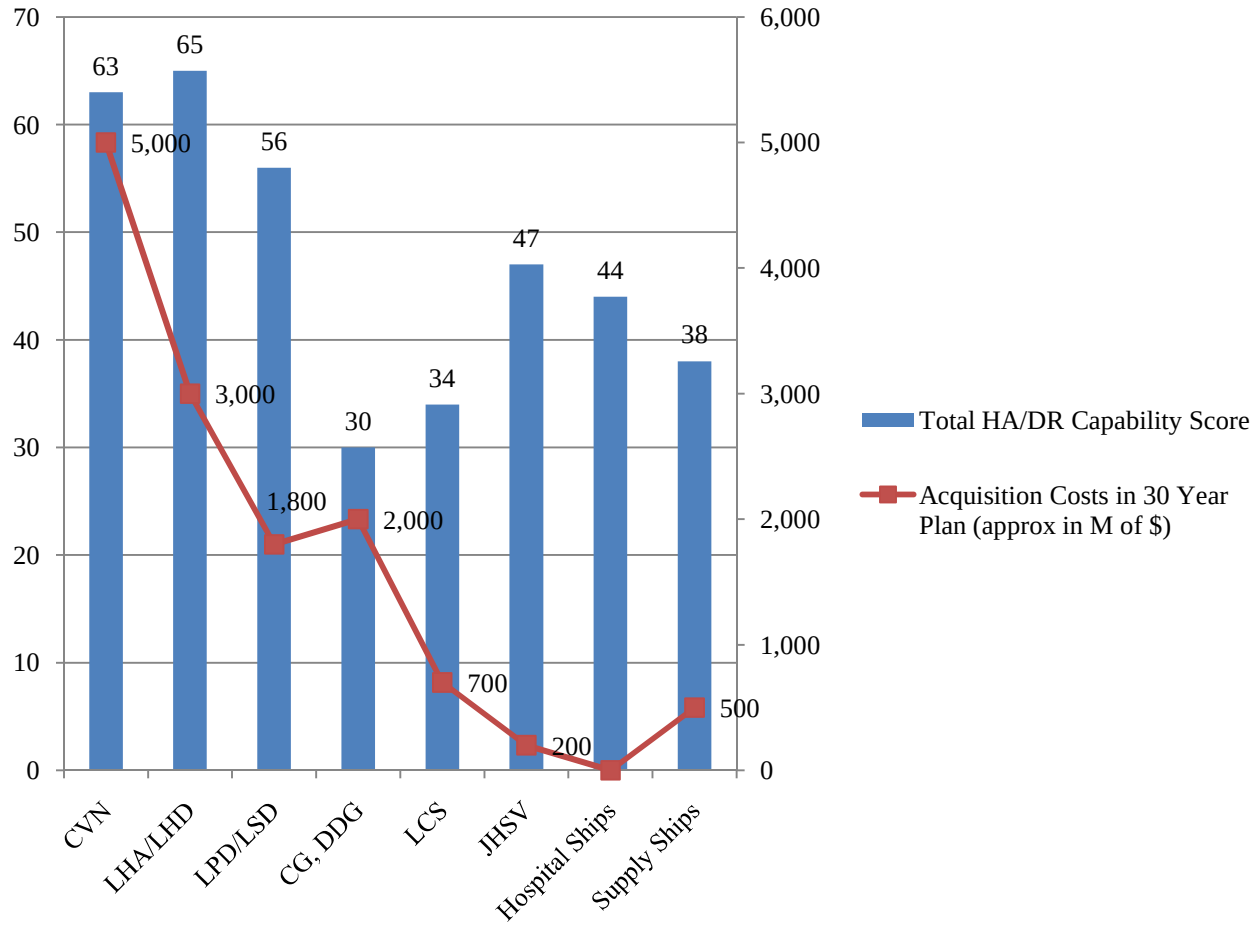

Figure 2. Total HA/DR Capability Score with Typical Acquisition Cost in $M[75]

When looking at Table 2, Table 3, and Figure 2, one sees a story emerge:

- The CVN and LHA/LHD platforms have incredible capabilities to support HA/DR, however they are expensive to acquire.

- The LHA/LHD is the highest capability platform and costs substantially less than the 2nd most capable platform, the CVN.

- The CRUDES (CG, DDG) and LCS platforms score lowest on capability and are relatively high cost to acquire.

[75] Costs obtained from Director, Warfare Integration, OPNAV N8F, "Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2011," February 2010, http://www.militarytimes.com/static/projects/pages/2011shipbuilding.pdf. Hospital ships are no longer in an acquisition pipeline so they appear as zero.

- The most cost effective, highest capability HA/DR response group would be a LHA/LHD and LPD/LSD combination.
- The Joint HSV provides a particularly significant pairing of low cost and high capability in reactive HA/DR situations. Plus, with modular construction, one can envision medical/hospital and humanitarian supplies variants of the JHSV as potential game changers in reactive HA/DR response.
- Hospital ships provide excellent capabilities, but are hampered by slow speed to station, deep draft, and lower helicopter capacity. The speed to station is the largest hindrance, meaning by the time they arrive on station for a natural disaster, their most unique function (high end trauma operating rooms) are not as in demand. While they are normally stationed stateside, they are now deploying on regular proactive HA/DR missions which better suits their capability strengths.
- While Supply Ships score on the lower end of the capability spectrum, they are essential to establishing and sustaining the sea base of operations during the HA/DR response.

One important note, most countries and commanders, if given the choice, will typically want more of a given capability. Local politics and sensitivities to local customs, however, must always factor into decisions on the extent and types of capabilities to utilize. In some cases, the Navy might have a fantastic ship-to-shore supply transfer capability using LCAC's and landing craft, but the optics of the U.S. "assaulting" the beach might not play well in certain circumstances, as discussed in the 2005 Indonesia tsunami experience.

3.2 – The Non-Equipment Capabilities:

One thing to consider is the essential capability not measured in the matrix - the non-equipment capability of motivated, professional Sailors and Marines. Hard to define and even more difficult to measure, but it is perhaps the U.S. Navy's most important capability. Anecdotal evidence points to this fact. Many officers and enlisted mention how the HA/DR mission convinced them to stay in the Navy.[76] In response to the 2010 Haiti earthquake, the Commanding Officer of the USS BUNKER HILL (CG-52) declared, "I have 309 Sailors who would dig latrines with plastic spoons if they thought it would help the Haitian people."[77] Although the BUNKER HILL does not have significant HA/DR equipment capabilities as presented in the Total Capability Score, her people still provide an intangible asset to any situation. That "can-do" attitude was seen repeatedly in Indonesia as Sailors developed and built from scratch a water manifold system for the effective filling of five gallon jugs.[78] Undoubtedly, there are thousands of stories of thousands of servicemen and women making spot decisions about how to best effect aid distribution and relief efforts. Empowering and training those Sailors and Marines on how to make the best decisions should remain a priority of the U.S. Navy.

3.3 – The 30-year ship building plan

The Navy's 30-year shipbuilding plan lays out the priorities for the surface force of the future. The current surface force will remain relatively similar over the next 30 years. Aircraft carrier numbers will remain static at 10-11 and LHA/LHD numbers will remain around 11 as well. The big differences are in the numbers of JHSV's. In the Congressional Budget Office's analysis, the 2010 plan includes a significant increase in the number of JHSV's from 3 to 23 when

[76] Discovered through the author's professional interactions with other naval officers who recounted stories of how the 2005 tsunami relief effort totally changed their minds about the Navy.
[77] Carl Meuser, "Lay your Ship," *USNI: Proceedings Magazine*, January 2011, Vol. 137/1/1,295, 37.
[78] Elleman, 44.

compared with the Navy's 2009 plan.[79] From the Navy's own document, they cite the JHSV's abilities to conduct proactive and reactive HA/DR. In the same passage they mention that LCS has similar capabilities to support HA/DR. Perhaps the Navy is referring to LCS's abilities in proactive HA/DR engagement activities.[80] As illustrated in this thesis, the LCS brings limited capabilities to reactive HA/DR situations for the cost of the platform. Additionally, in another nod to HA/DR capabilities, the Navy looks to make an increase of amphibious platforms from 31 to 33 between the 2009 and 2010 plans respectively.[81] Additionally, the Navy has committed to enhancing its sea basing capabilities, which proved useful during the reactive HA/DR missions in the case studies. Apparently, the Navy has started aligning the future force structure with HA/DR requirements spelled out in *CS21*.

Chapter 4: Policy Implications and Lessons

The Navy has the right strategy with *CS21*, and there is a large degree of buy-in within the Navy to accomplish the HA/DR mission set. The Navy, however, needs to continue to articulate the value of naval forces to Congress, the administration, and the public to obtain the resources necessary to carry out their strategy. The analysis in this paper revealed that the original hypothesis was incorrect. *The current Navy actually has sufficient capabilities to conduct reactive HA/DR effectively, and Navy planners have proposed a future force structure that maintains and enhances the Navy's ability to conduct HA/DR*. While maintaining a highly capable blue water force acts a deterrent for potential challengers, the Navy appears to be building up forces necessary to handle the "low-end" missions of reactive and proactive HA/DR. These would

[79] Congressional Budget Office (CBO), "An Analysis of the Navy's Fiscal Year 2011 Shipbuilding Plan," May 2010, 2.
[80] OPNAV N8F Report, 5, 15.
[81] CBO, 2.

include more low-tech amphibious platforms and smaller, less expensive ships like the JHSV deploy and operate easily with less capable host nation partner navies. Additionally, the Navy should remain invested in the "Sea Basing" concept. Sea Basing means having the means to use naval assets as a base, without needing land bases.

The nature of the post-Iraq and Afghanistan world will necessitate a move to sea based forces capable of projecting power world-wide with low-to-no footprint of the time. Additionally, dynamic forces like climate change could influence the need for more frequent proactive and reactive HA/DR missions. The Naval Studies Board recently released a study of the climate change implications on naval forces, which contends that the Navy should "[p]repare for increased strain on capabilities due to greater [HA/DR] related missions."[82] They contend that hospital ships, Navy Construction Battalion (SEABEES), JHSV's, and amphibious capabilities will be more in demand as climate change increases strain on already weak nations with extreme and unpredictable weather patterns.[83] Of course, funding enhanced HA/DR capabilities are not contingent on climate change, even without climate change considerations the policy of the United States Navy clearly states that HA/DR is a core competency. So while the initial hypothesis was incorrect, suggestions to create a future force even more capable in HA/DR are still germane.

- Force Structure:

First and foremost, the Navy must continue to look at its 30-year shipbuilding plan through the lens of the *CS21* strategy. Their goal to reach a larger Navy requires a substantial investment over the next 30-years. Yet, the goal should not simply be a number of ships, but rather the intended use, capability, and cost. Potential dynamic changes like climate change could increase the number and intensity of HA/DR responses, but even without climate change as, necessitate a

[82] Naval Studies Board (NSB), *National Security Implications of Climate Change for U.S. Naval Forces*, March 2011, National Academies Press, Washington, D.C., S-4.
[83] NSB, 2-3 – 2-6

serious look at the ship procurement budget better to get a cost conscious and capable force outlined in the *CS21* strategy.

- Consider purchasing additional JHSV's by reducing the LCS procurement: Joint High Speed Vessel (JHSV) is a proven, inexpensive platform which brings great capabilities in reactive and proactive HA/DR. Proposed increases in the JHSV 30-year plan bring the intended purchase of JHSV to 41 in order to maintain 23 JHSV's as the initial JHSV's retire at the end of their 20 year service life.[84] The JHSV can perform several of the Littoral Combat Ship's (LCS) functions. The troubled LCS procurement process has put Navy's acquisition practices into question. Cost overruns and concerns about the viability of the platform performing in a contested environment persist. Initially proposed as a low-cost, multi-warfare capable platform, the LCS is now at a high price of $500-700M per ship.[85] The Navy wants to eventually maintain 55 LCS platforms.[86] Yet, when looking at the potential future demand signals for reactive HA/DR, one wonders if the LCS brings much capability to the "fight." While both ships are fast with shallow draft, the JHSV costs about 60% less than the LCS and has considerable load and offload and surge berthing as well as the potential to be molded into a more capable HA/DR platform.

- Purchase New Modules for the LCS and JHSV's: Currently, the LCS program will consist of 64 of three deployable modules: Anti-Submarine Warfare (ASW), Anti-Surface Warfare (SUW), and Mine Warfare (MIW).[87] To accomplish the *CS21* strategy, a HA/DR module would also seem useful. The HA/DR module could contain expanded medical supplies and equipment, water purification equipment, generators, and mobile housing supplies to provide

[84] OPNAV N8F, 21.
[85] CBO, 2.
[86] CBO, 19.
[87] Murphy, 19-20.

essential services in a disaster area. These modules could be deployed on either LCS, providing the Navy with the flexibility desired in the *CS21*.

Additional specialized modules for the JHSV fleet could provide an extraordinary flexibility for Combatant Commanders (COCOMS). Instead of purchasing additional, expensive hospital ships like USNS MERCY, one could convert several JHSV's into "hospital ship-lite" platforms. These JHSV hospital ships could be easily used constantly throughout the SOUTHCOM, PACOM, and AFRICOM theatres in proactive HA/DR roles to build relationships with local populations and strengthen government ties. Of course, the JHSV hospital modules would be ready to deploy in support of reactive HA/DR missions as they arise. As we saw in the Indonesian tsunami HA/DR mission, the HSV's speed allowed it to arrive on station relatively quickly. Other special modules could include a Reverse Osmosis JHSV to deliver huge quantities of water in HA/DR situations and other supply, command and control, and SEABEE equipment modules could also prove useful.

Forward deploy the vital HA/DR assets: A considerable number of JHSV's should be forward deployed to the most HA/DR prone regions. Since the JHSV's have small crews manned by "blue and gold" crews of mixed civilian and military mariners, it could easily be stationed overseas. One suggestion would be creating specialized JHSVs HA/DR squadrons. These squadrons of 4-5 JHSVs could be housed or rotated in Guam, Bahrain, Naples, Diego Garcia, etc. The HA/DR squadrons could conduct almost constant proactive HA/DR patrols while maintaining readiness for reactive HA/DR missions. A squadron might consist of the medical, humanitarian supplies, SEABEE, and RO JHSV variants discussed previously. At least two of the JHSV's could embark a helicopter detachment, while the doctors, NGOs, and SEABEEs would be flown in and out of the area to sustain the necessary capabilities. These squadrons would form the nucleus of the HA/DR response, working in concert with MSC ships for supplies or other Navy

ships. The point of these HA/DR squadrons would be to lessen the burden on the CSGs and ESGs with low cost, high capability assets.

Prospects of Defense Department budget freezes or even cuts loom large as federal deficits continue to grow. One has to reflect on what this means for the military services, specifically the U.S. Navy. Navy has searched for a mission and a vision during the past decade, while the Army or Marine Corps engaged in protracted land conflicts in Iraq and Afghanistan. The *Cooperative Strategy for 21st Century Seapower*, outlines a compelling vision of the Navy as prevention asset with the notion that a good offense is the best defense. By offense, the Navy means being a proactive, world-wide presence working with international partners to improve cooperative security. The Navy needs to continue pressing ahead on the proposed 30-year shipbuilding plan looking for ways to optimize the return on investment of the current force structure when considering the increased mission focus on HA/DR. As one sees from the HA/DR capability analysis, the Navy must maintain its amphibious and supply ship capabilities while developing innovative modules for use on the JHSVs. These enhanced capabilities will serve the Sailors and Marines long into the future. Perhaps most importantly, the Navy must sustain a motivated and capable officer and enlisted corps. The equipment might be the easy capability to examine, but the Sailors attitudes and competence is the "x" factor in a successful HA/DR engagement. So, as the Navy puts the 30-year shipbuilding plan into action, the young officers and enlisted of today will instinctively know the value of HA/DR and how to conduct it efficiently. The lessons learned over the past six years already have made for faster, more decisive action as evidenced by the massive and orderly response to the Japanese tsunami. The Navy and the nation as a whole, however, owes a debt of gratitude to the Sailors that stitched together an incredible success story

off the coast of Banda Aceh in 2005. Those actions helped chart the Navy's new course and will continue to be felt long into the future.

Appendix A:

ARG – Amphibious Readiness Group

CG – Guided Missile Cruiser

CRUDES – Cruiser Destroyer (CG & DDG)

CSG – Carrier Strike Group

CVN – Aircraft Carrier

DDG – Guided Missile Destroyer

ESG – Expeditionary Strike Group

FFG - Frigate

HSV – High Speed Vessel

JHSV – Joint High Speed Vessel

LCAC – Landing Craft Air Cushion

LCS – Littoral Combat Ship

LCU – Landing Craft Utility

LHA/LHD – Amphibious Assault Ship

LPD - Amphibious Transport Dock

LSD - Dock Landing Ship

MPF – Maritime Preposition Force

MSC – Military Sealift Command

RHIB – Rigid Hull Inflatable Boat

USNS – United States Naval Ship

Appendix B: Value Determinations in Table 2

Capability	Value Determination	Value Points Awarded	Value Description
Helicopter:	High	3	More than 3 embarked helicopters and ability to land and launch more than 2 helicopters simultaneously. In fact, the LHA, LHD, and CVN can carry up to dozens of helicopters if configured correctly and could launch and land 3-6 if configured correctly.
	Medium	2	Less than 3 embarked helicopters and ability to land and launch 2 helicopters simultaneously
	Low	1	2 or less embarked helicopters and ability to land and launch only 1 helicopter at a time.
Surge Berthing:	High	3	Berthing available to flex (in some cases) to 1000+ or more (up to several hundred) NGO, special task force, etc. For the LHA/LHD it would require offloading Marine elements, and for CVN it would require
	Medium	2	Berthing available to flex from a 100+
	Low	1	Berthing limited to a few dozen or less
Medical Facilities	High	3	First Rate Medical Capability - ability to handle hundreds of patients for all medical emergencies
	Medium	2	Ability to handle dozens of patients
	Low	1	Limited ability to handle patients
Command and Control	High	3	Significant communications resources and bandwidth to coordinate entire battlegroup
	Medium	2	Communications resources to handle smaller scale operations
	Low	1	Limited communications ability
Load and Offload Capabilities	High	3	Cranes, cargo space, and/or roll on/roll of capabilities to transfer stores and equipment in port or at sea
	Medium	2	Not a significant Value
	Low	1	Limited ability to load and offload cargo - limited space for cargo
Potable H2O	High	3	Significant onboard water generating capability - Enough to supply provide water ashore
	Medium	2	Some onboard capacity to generate fresh water for external needs
	Low	1	Little onboard capacity to supply fresh water to external needs
Humanitarian Supplies	High	3	Significant supplies can be loaded onboard - space is available
	Medium	2	Some supplies can be loaded and stored onboard
	Low	1	Limited supplies can be loaded and stored onboard
Small Boats and Landing Craft	High	3	Multiple Landing Craft like LCACs and LCUs as well as small boats RHIBS
	Medium	2	Medium size boats like Boston Whalers, Captain's Gig, and RHIBS
	Low	1	One or two boats (various sized RHIBS)
Draft	High	3	Very shallow draft - 11-20 feet
	Medium	2	Medium draft - 21-29 feet
	Low	1	Very deep draft 30+ feet
Speed to station	High	3	Over 32 Knots
	Medium	2	25-31 Knots
	Low	1	17-24 Knots

BIBLIOGRAPHY

Albon, Christopher R, "Why Navies Love Soft-Power" September 22, 2009, accessed online on Oct. 31, 2010 at http://conflicthealth.com/why-navies-love-soft-power/

Burt, Lawrence, "Carrier Air Wing Two: Surge Deployment & Operation Unified Assistance" PowerPoint Briefing obtained in open internet search, accessed at http://www.nps.edu/Academics/Institutes/Cebrowski/Docs/Burt%20BRIEFING1.ppt.

Carr, Robert J., "The Mission is Warfighting, Not Relief, *USNI Proceedings Magazine*, December 2010 Vol. 136/12/1.

Cavas, Christopher P., "JHSV gets larger role in Navy, Marine plans," Navy Times, Feb 3, 2010, http://www.navytimes.com/news/2010/02/defense_navy_jhsv_020310w/.

Cole, Justin T., "Lefever, Disaster Assistance Center Pakistan Honored At Embassy," *Navy.mil Official Website*, Sept. 9, 2006, accessed at http://www.navy.mil/search/display.asp?story_id=25725.

Congressional Budget Office, "An Analysis of the Navy's Fiscal Year 2011 Shipbuilding Plan," May 2010.

Commander, Naval Forces Japan Public Affairs, "US Navy Provides Pumps to Assist in Reactor Cooling Effort," March 18, 2011, http://www.c7f.navy.mil/news/2011/03-march/040.htm.

Department of Defense, *Quadrennial Defense Review Report*, February 2010.

Department of the Navy and U.S. Coast Guard (ADM Gary Roughead, USN; Gen James T. Conway, USMC; and ADM Thad W. Allen, USCG), *Naval Operations Concepts 2010, Implementing the Maritime Strategy (NOC 2010),* June 2010.

Department of the Navy and U.S. Coast Guard (ADM Gary Roughead, USN; Gen James T. Conway, USMC; and ADM Thad W. Allen, USCG) *A Cooperative Strategy for 21st Century Seapower (CS21),* Oct 2007.

Director, Warfare Integration, OPNAV N8F, "Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2011," February 2010, http://www.militarytimes.com/static/projects/pages/2011shipbuilding.pdf.

Dixon, Kim "Lewis and Clark Keeps Pakistan Flood Response on Track" *MSC Press Release*, September 14, 2010, accessed at http://www.navy.mil/search/display.asp?story_id=55940.

Elleman, Bruce A., *Waves of Hope*, (Newport, RI: Naval War College Newport Papers, Volume 28, February 2007).

Friedman, N.. "A Shift to Soft Power." United States Naval Institute. Proceedings, (2008, September). 134(9), 90-91.

Gray, Denis D., "U.S. choppers find remote survivors," *Washington Times*, January 4, 2005, accessed at http://www.washingtontimes.com/news/2005/jan/4/20050104-120818-1368r/?page=all#pagebreak.

Jain, Purnendra and John Bruni, *Asia Times Online*, "America's 'unsinkable aircraft carriers'," June 4, 2003, http://www.atimes.com/atimes/Japan/EF04Dh02.html .

Kaplan, Robert, "America's Elegant Decline," The Atlantic, Nov 2007, accessed online on Oct. 31, 2010 at http://www.theatlantic.com/magazine/archive/2007/11/america-8217-s-elegant-decline/6344/.

Kaplan, Robert D., Hog pilots, blue water grunts : the American military in the air, at sea, and on the ground (New York : Random House, 2007).

Kliman, Daniel *Disaster in Japan: Nuclear Energy, the Economy and the U.S.-Japan Alliance*, March 18, 2011, accessed at http://www.cnas.org/files/documents/publications/CNAS_DisasterInJapan_policybrief.pdf.

LaCroix, F. W, Forks in the road for the U.S. Navy, Irving N. Blickstein Santa Monica, Calif. : Rand, 2003

Lubold, Gordon, "U.S. Navy aims to flex 'soft power': Goodwill missions could become the Navy's chief strategy in the war on terror." Christian Science Monitor, Dec. 27, 2007 accessed online on Oct. 31, 2010 at http://www.csmonitor.com/2007/1227/p02s01-usgn.html.

Meuser, Carl, "Lay your ship," *USNI Proceedings Magazine*, Jan 2011 Vol 137/1/1,295.

Mullen, Michael G., Chairman of the Joint Chiefs of Staff (CJCS), *The National Military Strategy of the United States of America 2011: Redefining America's Military Leadership*, Feb. 08, 2011.

Mullen, Michael, "Commentary: We Can Not Do It Alone," *Honolulu Advertiser*, Oct. 06, 2006, accessed at http://www.navy.mil/navydata/cno/mullen/Honolulu_Advertiser_October_29_2006.pdf.

Murphy, Martin, "Littoral Combat Ship: An Examination of It's Possible Concept of Operations." Washington, DC: CSBA (www.csbaonline.org) March 2010.

Naval Studies Board, *National Security Implications of Climate Change for U.S. Naval Forces*, March 2011, National Academies Press, Washington, D.C.

Naval Warfare Development Command (NWDC) TACMEMO 3-07.6-05 "Humanitarian Assistance/Disaster Relief (HA/DR) Operations Planning," August 2005. Access online: http://www.au.af.mil/au/awc/awcgate/navy/tm_3-07-6-05_navy_ha&dr_ops_plng.pdf.

Navy Fact File (LHA/LHD/LHA-R) http://www.navy.mil/navydata/fact_display.asp?cid=4200&tid=400&ct=4.

Navy News Service – Pictures accessed at http://www.navy.mil/search/photolist.asp with search term "HSV tsunami 2005."

Navy Program Guide 2009, *Sea Power for a new Era: Appendix A: Navy-Marine Corps Crisis Response and Combat Actions*, 2009, accessed at http://www.navy.mil/navydata/policy/seapower/sne09/Navy%20Program%20Guide%202009.pdf.

Navy Recruiting Website main page, http://www.navy.com/navy/about/gffg/.

Nossel, Suzanne, "Smart Power" Foreign Affairs, Vol. 83, No. 2 (Mar. - Apr., 2004).

Nye, Joseph S. Jr., "Soft Power" Foreign Policy, No. 80, Twentieth Anniversary (Autumn, 1990).

Nye, Joseph S. Jr., "Limits of American Power." Political Science Quarterly, Vol. 117, No. 4 (Winter, 2002-2003).

Nye, Joseph, and Armitage, Richard, CSIS Commission on Smart Power : a smarter, more secure America (Washington, D.C. : CSIS Press, c2007)

Revkin, Andrew C., New York Times, "A Push to Increase Icebreakers in the Arctic," August 16, 2008, http://www.nytimes.com/2008/08/17/world/europe/17arctic.html.

Terror Free Tomorrow, *A Major Change of Public Opinion In the Muslim World: Results from a New Poll of Indonesian,* 2005, accessed at www.terrorfreetomorrow.org.

Terror Free Tomorrow, "A Dramatic Change of Public Opinion In the Muslim World: Results from a New Poll in Pakistan," 2005, www.terrorfreetomorrow.org.

Tilghman, Andrew, "Survey: Officers favor 'soft power'," Navy Times, Sep 27, 2010, accessed online on Oct. 31, 2010 at http://www.navytimes.com/news/2010/09/military-officers-survey-iraq-afghanistan-soft-power-092510w/.

Tillman, Barrett, "Fear and Loathing in the Post-Naval Era," U.S. Naval Institute- Proceedings Magazine, June 2009 Vol. 135/6/1,276, www.usni.org.

Thompson, Cassandra "USS Pearl Harbor, Seabees Bringing Relief Equipment to Pakistan," *Navy News Stand,* Oct. 14, 2005, accessed at http://www.globalsecurity.org/military/library/news/2005/10/mil-051014-nns01.htm.

Tyson, Ann Scott, "New Maritime Strategy to Focus on 'Soft Power'", Washington Post, Oct. 17, 2007, accessed online on Oct. 31, 2010 at http://www.washingtonpost.com/wp-dyn/content/article/2007/10/17/AR2007101700536.html

Whiteneck, Daniel and others, "The Navy at a Tipping Point: Maritime Dominance at Stake?" CNA, March 2010.

U.S. DoD, 2005 Year in Review, "When the Earth Shook"
http://www.defense.gov/home/features/2006/2005yearinreview/article4.html

U.S. Southern Command (SOUTHCOM), "Narrative History of Operation Unified Response," May 25, 2010, accessed at http://www.southcom.mil/appssc/factFilesLarge.php?id=138.

USS TARAWA (LHA 1) Command History, http://www.uscarriers.net/lha1history.htm.

Websites that helped inform the tables and figures:
http://www.defense.gov/home/features/2005/pakistan/
http://www.navy.mil/navydata/leadership/quotes.asp?q=11&c=6
http://www.defense.gov/home/features/2010/0810_pakistan/
http://www.navsource.org/
http://www.southcom.mil/appssc/news.php?storyId=765
http://www.msc.navy.mil/sealift/2008/august/typhoon.htm
http://www.navy.mil/search/display.asp?story_id=48705
http://www.dodlive.mil/index.php/2009/10/us-troops-provide-disaster-relief-to-the-philippines/
http://www.pacom.mil/web/site_pages/media/news%20200910/20091002-AidtoPhilippines.shtml

http://www.pacom.mil/web/Site_Pages/Media/News%20200910/20091009-HelicoptersBeginRelief.shtml
http://www.msc.navy.mil/N00p/pressrel/press10/press04.htm
http://www.navy.mil/search/display.asp?story_id=53217
http://www.windsofchange.net/archives/007448.html
http://www.navy.mil/navydata/fact.asp