

The Sinking Ship: The American Shipbuilding Industry

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Abstract

Ever since they were a British colony, the shipbuilding industry has been a part of the American manufacturing. However, today the American shipbuilding industry has been slowly crumbling. It has in fact been crumbling for a long time, but no one has done a thing to stop it. There are several factors that have contributed to the collapsing shipbuilding industry. Foreign competition has made it difficult for the American shipbuilding to be internationally competitive because they have far surpassed the US. However, subsidies, or the lack thereof, is the largest contributing factor as to why US shipbuilding declined. The United States did once subsidize the shipbuilding industry, but when President Reagan got rid of them without any similar action from other countries, the shipbuilding industry was finished. There now lies an opportunity to try and save the industry. However, any kind of significant legislative reform will only be achieved after there has been serious fundamental changes in the way that the US attitude, understanding, and perception of these maritime issues.

Key words: American shipbuilding, foreign competition, subsidies

Introduction

In today's ever increasingly globalized world, the amount of trade goods flowing between nations is greater than it has ever been in history. Each year, billions of metric tons, trillions of US dollars (USD) worth, of trade goods are transported by sea by over 52,000 merchant vessels. It's something that much of the population doesn't know or appreciate, but roughly ninety percent of the world's goods are transported by sea. The importance of the sea has always been an integral, and often underappreciated, part of a nation's strength. One man

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who understood this was Captain Alfred Thayer Mahan, an American naval officer and lecture who wrote *The Influence of Sea Power Upon History*. The book was an analysis of the importance of naval power as a factor in the rise of the British Empire. In his book, Mahan claimed that the United States needed three things to become a successful naval power: a strong merchant fleet, a strong naval, and a network of naval bases (Mahan, 1890). Today, the United States has two of these three. While the US Navy is the most powerful navy in the world and has bases across the world, the US is severely lacking a merchant fleet. The US has around 112 vessels in its merchant marine fleet. The purpose of the merchant marines is to transport goods between a US port to a US port as well as be ready to provide sealift for the US armed forces should the need arrive. However, this current fleet is nowhere near enough to meet sealift that the United States needs. Not only are there not enough ships, but most of the ships are so old that they still use parts that are no longer used in the commercial industry. The United States utter lacking of a strong or prepared merchant fleet has many naval experts worried. Someone outside the industry would say “just build more ships”, but that’s where the problem lies. The US shipbuilding Industry is struggling to stay afloat. America’s shipbuilding industry was once the best in the world, but has been in decline ever since. This is due to a whole host of reasons. The main reasons are foreign completion and the fact that there is next to no support from Congress. But, why doesn’t the government support the shipbuilding industry? There have been several times in the history of this country that has shown repeatedly the implications of not having a healthy merchant fleet. So would it not be in the best interest of the United States to have a strong shipbuilding industry to maintain a healthy Merchant Marines for the sake of national security? During the Great White Fleet’s trip around the world beginning in 1907, they couldn’t supply the fleet with fuel. During Operation Desert Storm in 1990, they didn’t have enough ships

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to move troops and supplies overseas. If nothing is done to fix the shipbuilding industry, the United States' military will not have adequate sealift capabilities for when the need will arise.

Historical Context

Even though it has always been a part of American industry since its formation, the United States has rarely given much thought about its maritime industries. Perhaps, it is because they sometimes had difficulty seeing the true importance of the maritime on the world. It was usually treated as an afterthought, ignored and put in the background in favor of other industries. Since it was a British colony, America has had a ship building industry. The New England colonies began to hone their skill as shipbuilders, making good use of the abundance of trees and natural harbors. The colonists established shipyards in Massachusetts in the early-17th century, making shipbuilding one of America's earliest manufacturing industries. Most first ships that were produced in the colonies were small fishing boats and coastal transport vessels, but before too long, they started producing oceangoing vessels in the late-seventeenth (Gibson & Donovan, 2001). After the first ship was made, the American shipbuilding industry began to flourish. There were not only shipyards in New England, but New York and Delaware as well. It was not uncommon for entire coastal towns to be dedicated toward shipbuilding. People would provide timber, hardware, cordage, sails, and labor (Gibson & Donovan, 2001). These shipyards were turning out and repairing merchant ships for a century, starting in the late-seventeenth century going until the mid-to-late eighteenth century. It was partially because of the success that the colonies had as merchants, especially trade with the Caribbean, that led them to begin to see themselves as more than just a colony, but as men who deserved the same political rights as their British counterparts (Gibson & Donovan, 2001). Despite their shipbuilding industry, the newly formed United States could not build a fleet that could defend against the British Royal Navy,

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the greatest naval power in the world at the time. During the Revolutionary War, most of the Continental navy's ships were either captured or destroyed by the British forces, while the rest of them were destroyed by the Americans to keep them from falling into the British hands (The Eisenhower School, 2017). The colonies lacked any large ships so they could not engage the British in naval warfare. They had to find a way to procure munitions; however, many of their ports were under a British blockade. To remedy this, the colonies built the "Virginia-built" schooners in the late eighteenth century. These vessels were useful for both trade and privateering. These small schooners were counted among the first official navy of the colonies. The "Virginia-built" ships are actually known today by another name. Back then they were Baltimore schooners; however, they were the precursors for the ships that people today would know them as the Baltimore Clippers (Chapelle, 1988). Despite the usefulness of these ships, by the end of the war, the infant nation had no real navy to speak of. Many of the schooners were merchant or privateer ships and once the war was over in 1783, they went back to being that. These merchant schooners were not fast enough to out run the British blockade in the War of 1812, so the US developed larger, faster, and more heavily armed ships that were designed specifically for privateering, called the Baltimore Clippers (Chapelle, 1988).

The United States didn't have a navy until 1791. Congress worried that it would be too expensive to build and maintain a navy, but with their merchant ships being harassed by pirates and foreign powers, they realized that they could not afford not to have a Navy. During the War of 1812, the United States had a small, but lethal ships. Their fleet had world-class ships that gave them the edge over the Royal Navy (The Eisenhower School, 2017). For the first half of the century, roughly between 1815 to 1857 American shipbuilding reigned supreme and American merchant shipping was actually competitive. However, in the mid and late 19th century, global

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shipping had already begun to transition from using wooden sail ships to iron steam ships. It was during this time that the American shipbuilding industry's supremacy began to diminish.

American shipbuilders slowly began to lose its competitive advantages. There are a few reasons as to explain why the pendulum began to swing away from America and toward British shipbuilding supremacy.

While American interests strayed from the coast and turned inland, global shipping found a new home in the more industrialized economies of Western Europe. One reason why it began to shift was the British began to change their approach of measuring their ships tonnage, mainly for tax purposes. Previously, they measured the tonnage by length. Shipbuilders were more concerned with tax considerations, they made efficient ship designs an afterthought. However, they changed the measurements from length to depth in 1854. Now, the merchants were no longer hindering the efficiency of the ship for tax purposes. This left the design and building of the ships in the hands of those who knew best. This is now the approach that most maritime countries use today (Whitehurst, 1986). Next, during a time when the US shipbuilding industry and the American clippers were the envy of the world, the British shipbuilding industry was more willing to take risks and invest to steam propulsion. The American shipbuilders were satisfied with the money that they were making from their wooden sailing ships and didn't take steam propulsion seriously until 1845 (Whitehurst, 1986). Another reason was the British had repealed the Navigation Act. This act essentially was meant to protect the British colonial lumber industry by placing duties on foreign imported lumber. It also protected English-built ships from foreign competition by excluding foreign ships from both England's colonial trade and home trade. While it protected the shipbuilding industry, it also made it complacent. With its repeal, ship owners were allowed to buy ships from wherever they wanted. This made British

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shipbuilders have to be more competitive, investing in steam propulsion and designing faster ships (Whitehurst, 1986). Finally, the British shipbuilding industry had a bit of a lead on American industry thanks to the fact that they had easier access to cheaper iron due to their large domestic iron industry (Hanlon, 2017).

It wasn't until after the American Civil War in the 1860s and during the Spanish American War in the 1890s did American shipbuilding start developing modern iron steam warships. Thanks to the writings of Captain Alfred Thayer Mahan, the United States started to take the importance of a Navy seriously in the early 20th century. However, their commercial shipbuilding was still lagging behind. Before World War I, the US merchant fleet carried less than eight percent of America's international trade. Mahan saw the importance of maintaining a merchant fleet as well as a combat fleet as a merchant fleet could provide a means of supply as well as wealth. America's lack of the logistical support provided by a healthy merchant fleet showed when President Teddy Roosevelt's Great White Fleet sailed the world and the Navy had to charter support vessels from different countries along the way. The voyage taught the Navy a very important lesson. They saw how vulnerable they were. They saw how the fleet would have been immobilized due to the lack of logistical support had war broken out. Though they saw this, they didn't exactly fix it. Instead of creating a healthy merchant fleet, they instead invested in the construction of five additional naval collier ships to fuel the fleet, bring the total of collier ships to seven. This fact also ended up hurting America when they joined World War I and faced a shortage of sealift capacity. They tried to make up for it by quickly building as many ships as they could, but the war was over before most of the vessels were done (The Eisenhower School, 2017).

The one time the United States had a strong shipbuilding industry prepare for crisis was just before War World II broke out in 1939. President Franklin Roosevelt realized the importance of a strong merchant fleet and passed the Merchant Marine Act of 1936. This act established construction and operating subsidies for ships as well as created the US Maritime Commission. Thanks to this foresight, when Japan bombed Pearl Harbor in 1941, destroying fifteen US warships and crippling the Pacific Fleet, the US had not only repaired twelve out of fifteen of the ships by 1944, but they were turning ships faster than the Navy could commission them (The Eisenhower School, 2017). This was the one of the two times the US shipbuilding industry was number one in the world, building more ships than Britain, Germany, and Japan combined.

The Industry Today

As of 2015, Trade between the United States and other countries comes out to more than 5.2 trillion USD, 2.3 trillion dollars in exports and 2.9 trillion dollars in imports. This makes the United States the third largest exporter in the world behind China and the European Union (Desilver, 2015). Most of this trade is moved by sea, however, very little of the trade is actually transported on ships that were built in the United States, or even American-owned ships. Today, the United States claims about 1 percent of 1 percent of the market on large ocean going vessels (McMahon, 2017). Prior to the Reagan Administration, the United States dominated the global commercial shipbuilding market, but now, they mainly build ships that are confined to operating on routes within the US. These ships business is largely limited to moving goods from the continental US to Hawaii, Alaska, Puerto Rico, and Guam.

There are approximately 124 active shipyards in the US. That may seem like a fair amount of shipyards, but it isn't enough. Many of these shipyards only have the ability to build

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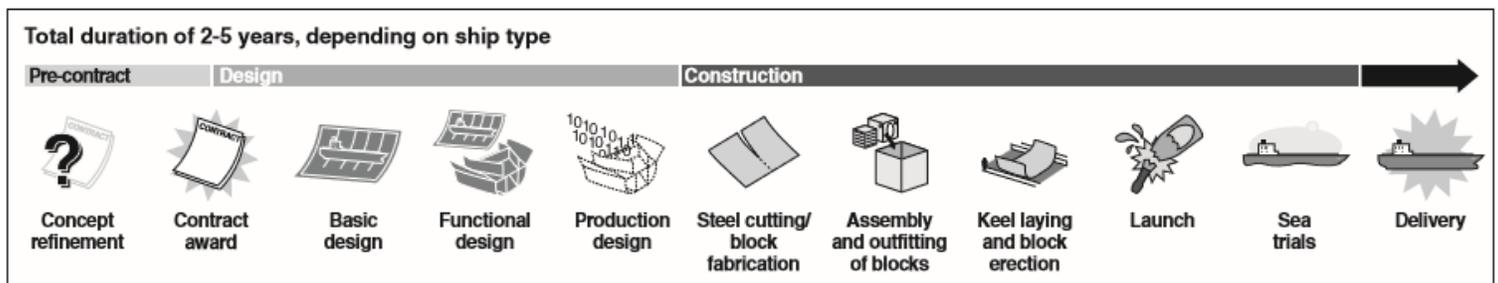
smaller vessels or barges that are used for domestic trade and inland water passage. Only around 22 of them are for building naval warships and submarines, and 8 of those 22 sometimes get contracts to build commercial vessels. The industry directly accounts for around \$9.2 billion in labor income and \$10.7 billion in gross domestic product (GDP) a year and indirectly accounts for \$25.1 billion in labor income, and \$37.3 billion in GDP. It also accounts for employing more than 100,000 workers directly and almost 400,000 jobs indirectly (Maritime Administration, 2015). This is only mentioning the national impact of shipbuilding, at the state level, there are thirty-seven states in which the shipbuilding and repairing industries' operations provide direct employment for. Virginia, Mississippi, Louisiana, Connecticut, and California are the states with the largest impacts for direct employment. As of 2013, these states' operations make up around six-three percent of the total industry operations. As for employment associated with the shipbuilding and repairing industry, either created directly, indirectly, or induced, Virginia, California, Mississippi, Louisiana, Texas, Connecticut, and Florida rank the highest (Maritime Administration, 2015).

Many of these shipyards are relying on government grants and shady business practices to stay afloat. And even though the average age of the US merchant ships is around 43 years old with technology that is no longer being used by the industry anymore, many of these shipyards don't have any more vessel orders on their books. This has led to layoffs in many shipyards around the country (Paris, 2018). Additionally, the US turns out so few commercial ships that they amount to less than .5 percent of world-wide ship construction. On a good year, they will finish building maybe 4 to 5 vessels. Now these are very good vessels. The United States build some of the most technologically advanced ships, but they can't make them quick enough and they are quite expensive, usually costing a couple hundred million dollars, at least four or five

times more than vessels built by foreign shipyards. This has resulted in a kind of artificial scarcity of large ocean going vessels in the United States' domestic trade, causing prices to increase dramatically. The high production costs then in turn leads to a reduction in commissions for the construction of new ships. These compounding with the fact that American ship-owners have to deal with higher insurance premiums and heftier US sailor salaries make it more appealing for companies to buy from foreign shipbuilders.

Phases of Shipbuilding

Whether commercial or naval shipbuilding, shipbuilding is a complex, multistage process that includes several key steps that are the same despite the type of ship is constructed or who it is being constructed for. There are three primary phases of shipbuilding: pre-contract, design, and construction. Each subsequent phase then builds upon the work that was completed in the previous phase.



Source: GAO.

The pre-contract phase begins with a buyer coming up with their ship concept. At this point, they don't have to have a shipbuilder already chosen. They can work with different shipbuilders to help refine their ship concept. This phase is finished once the buyer settles on a design concept and awards the contract to one or more shipbuilders. The buyer then sends the design concept to the shipbuilders for the design phase. While there is some design work done during the pre-contract phase, the design phase focuses on three activities: basic design,

functional design, and production design. During this phase, the shipbuilders use three-dimensional modelling software as well as regular 2D blueprints that the shipyard workers use on site. The purpose of the basic design step is to outline the steel structure of the ship. Functional design then draws up plans for the distributive systems that run through out the ship., things like electrical or piping systems. Finally, production design finalizes the instructions for the shipyard workers used to construct the ship (GAO, 2009).

The final phase is the construction phase. The first step in the construction phase is steel cutting. This step involves cutting large steel plates with computerized cutting machinery, laser etching, and robotics into the correctly sized pieces that were laid out in the previous phases. These steel plates are then welded together into larger pieces called blocks, which are the basic units that make up the ship. This step is called block fabrication. The next two steps are assembly and outfitting of blocks and Keel laying and block erection. These two are the actual construction of the ship itself. Once they are confident that they have made the ship watertight, they make the decision to launch. They don't actually launch the vessel to sea, they fill the drydock with water and float the ship in water to make sure that it can float. The criteria to determine whether the ship is ready for launch differs from shipyard to shipyard. One Korean shipyard usually launches their ships when they are ninety-five percent complete. Another European shipyard launches their ships closer to fifty percent (GAO, 2009). Once they are sure of the ship's seaworthiness and have finished up any activities and final touches on the ship, they bring the buyer on board and they embark on a sea trial. The ship is evaluated on its performance and quality. If the sea trial is successful, then the shipyard hands the ship over to the ship owner (GAO, 2009).

Now, this may seem like a bit of a tangent, but the purpose of this section is to show how what the normal process of commercial shipbuilding in the US is to then compare it to how naval shipbuilding in the US is.

Commercial vs Naval Shipbuilding

Commercial shipbuilding tends to be far more organized than naval shipbuilding. In commercial shipbuilding, it is imperative that ships are delivered on time and are within the set budget given to them. The commercial shipbuilders and buyers do not proceed onto the next phase until they are confident with the knowledge they have attained so that they can make sure that the design and construction of the ship goes exactly as planned. When buying a ship from commercial shipbuilders, they almost always use firm, fixed-prices. This means that the prices are not subject to any adjustment due to the contractor's experience while building the vessel. It also places the sole responsibility for any and all costs, profit or loss on the contractor (GAO, 2009). The shipbuilder and buyer have to reach an understanding of what they need to do before they even sign a contract. Commercial shipbuilders will generally know which vendors they are going to use for equipment and will negotiate with their material suppliers before they sign the contract. This is to make sure that they can accurately price what their bid will be to the buyers. Once an understanding is reached, the buyer and the shipbuilder then sign a contract that lays out the fixed price, delivery date, and the ship's performance parameters. The two want to minimize risk so they reuse previous designs where they are able and make sure that they have an understanding of the new technologies available to them. The shipbuilders make sure that they have fully completed important steps in the design phases before they move on to the construction. They have to know all the information possible on the systems that are needed to go into the ship before they can proceed. Finally, throughout this entire process, the buyer is

allowed to maintain a presence in the shipyard and at key suppliers to make sure that the ships will meet the expected quality and will be completed on schedule (GAO, 2009).

All that is just standard procedure that seems like it wouldn't need to be stated, but the problem lies in the fact that almost none of this happens with naval shipbuilding. When the Navy wants to commission a vessel, all six of the shipyards that can build Naval vessels bid on the contract. The lowest bidder is awarded the contract. Naval programs set ambitious requirements and make substantial investments into technology development but do not give the technology time to fully mature. The Navy also likes to come up with new ship designs that barely use the designs of previous ships. Having to create a new design for a ship doesn't give them the adequate amount of time to gain a full understanding of the effort needed to complete the program. The shipbuilders sign the contract without fully knowing what they need to do. So, this usually turns into a lot of trial and error shipbuilding which then causes the Navy and the shipbuilders to rely on cost-reimbursable contracts instead of the fixed-price contracts that commercial shipbuilders use. Sometime changes have to be made well into construction due to some mistake or something they overlooked. All of these inefficient practices have led to the prices of Navy ships to be way higher than they should be. Additionally, if the naval shipbuilder has to delay the ship's delivery, the consequences are not as severe since they are using a cost-reimbursable contract.

Now, the Navy does have a reason behind this madness. Navy shipbuilding practices are the way they are because the Navy wants to prioritize revolutionary technology, but often times this comes at the expense of their other competing demands. They invest so heavily into new technologies in the hope to outpace and outmatch any future threats that may arise. While the end result is that they build some of the most capable and robust ships in the world, it makes

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them expensive and causes them to take a long time to complete. Often times, the Navy will set ambitious requirements for their ships that aren't possible with the technology they have. They then spend significant resources toward identifying and developing the technologies needed to meet their requirements. Sometimes all this work is for nothing because due to insufficient time, the Navy will invest loads of money into a developing technology but will abandon them if it takes too long to complete a prototype, or even develop (GAO, 2009). With this emphasis placed on advancing individual technologies, the Navy often doesn't give shipbuilders enough time during the pre-contract phase to identify and fix any technical risks. They also don't give a lot of time early in the program for stakeholders to come in and evaluate and set clear requirements, specifications, and costs. Instead, these decisions are often times just pushed through by downplaying the amount of cost uncertainty. If the Navy took the time to have open and honest dialogue with stakeholders, they would be able to eliminate a number of technical risks, as well as save a lot of money. Because of this, the Navy will award the contract to a shipbuilder even though there are still serious technical risks, unclear expectations, and cost uncertainty (GAO, 2009). This is why the Navy cannot have their ships commissioned with fix-price contracts and they have to use cost-reimbursable contracts instead. The costs, schedule, and risks all lie primarily on the government's shoulders instead of the shipbuilders which then leads to more cost growth and scheduling delays. The Navy and Congress have taken some steps to attempt to address these challenges, however there are still significant differences between the best practices of the commercial shipbuilding industry and Naval shipbuilding industry.

Phase	Navy practices	Commercial practices
Pre-contract	<p>Navy programs generally proceed with high levels of risk and uncertainty</p> <ul style="list-style-type: none"> Requirements are not constrained by technology availability Ship concepts may not leverage existing designs to minimize risk 	<p>Commercial shipbuilders and ship buyers retire all major risk prior to signing a contract</p> <ul style="list-style-type: none"> Shipyards will not sign a contract if there is outstanding technical risk Shipyards and buyers leverage existing designs to minimize risk
Contract	<p>Navy programs cannot fix the cost and delivery date for a ship at contract signing</p> <ul style="list-style-type: none"> Programs use cost-reimbursable contracts for lead and early follow-on ships Navy can change specifications/drawings as critical technologies develop Because technologies often remain in development at contract signing, eventual ship performance remains uncertain 	<p>Commercial shipbuilders fix the cost and delivery date for a ship at contract signing</p> <ul style="list-style-type: none"> Leading buyers and shipbuilders use only firm, fixed-price contracts Buyer cannot change specifications/drawings without incurring financial or technical performance penalties once a contract is signed Shipyards guarantee that the ship will perform as defined in the agreed specifications
Design	<p>Navy programs attain varying levels of design completion prior to starting construction</p> <ul style="list-style-type: none"> Ship programs may prematurely start construction to support the industrial base 3D CAD is under way, but not fully complete at construction start 	<p>Commercial shipbuilders complete all basic and functional design prior to starting construction</p> <ul style="list-style-type: none"> Shipyards will not start construction until a design is complete and stable 3D CAD is completed prior to construction
Construction	<p>Navy programs are characterized by construction inefficiencies that impede ships from delivering within cost and on schedule</p> <ul style="list-style-type: none"> The amount of time a ship spends under construction—or in the drydock—is not of critical importance to the shipbuilder when faced with low or uncertain future workload Design changes during construction are common and can cause schedule delays and cost growth Navy maintains a shipyard presence, but is often slow to respond to changes in workload distribution and complexity 	<p>Commercial shipbuilders have a disciplined construction process that delivers ships within cost and on schedule</p> <ul style="list-style-type: none"> In order to maintain tight schedules across multiple ships, drydock time is rigorously monitored and controlled by the shipbuilder Change orders are minimized to avoid delays and cost growth Buyers perform vigorous oversight of construction in order to ensure quality and to monitor schedule

Source: GAO analysis.

Some of the issues with naval shipbuilding are entirely the fault of the Navy. However, when the Navy awards the contract to the shipyard with the lowest bid, the shipbuilders sometimes like to turn around and basically build in fifteen percent or more profit into the whole thing. The naval shipbuilders take advantage of the contracts they are given and will charge the government a ridiculous amount of money. A portion of the charges aren't even a part of the ship. The shipbuilders will use shady practices to charge the government extra at every step of the process. As previously mentioned, there are steps and phases to shipbuilding. Commercial shipbuilders will generally follow this process step by step, however, naval shipbuilders love to go back and forth. One practice that is common among naval shipbuilders is that after they have

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completed the design phase and have begun the construction phase, they will often go back to the design phase and begin to make changes to the design of the ship. They then charge the government an extra amount because they have to redo work that they have already completed. They will do this at any stage of the construction phase, no matter how close the vessel is to being completed. Sometimes, this process is not solely due to the shipbuilders wanting to make money. As previously mentioned, the Navy tends to make overly ambitious requirements and use technologies that have not fully developed. There is another shady practice that is used by naval shipbuilders happens during the construction phase. During the process of steel cutting and block fabrication, the shipbuilders will accidentally, sometimes purposefully, cut the steel in the wrong measurements. They then put that steel to the side and cut another piece, still charging the Navy for the steel that was cut wrong.

While the commercial shipbuilding prices may be higher than the global average, US Naval shipbuilding is far worse than that. While the US Navy does build the most sophisticated and technologically advanced ships in the world, they have to pay way too much. Of course, there are many different types of ships in the Navy, destroyers, aircraft carriers, submarines, and so on. Each one varies in size, cost, and capability. On average, a new naval vessel, depending on the type of ship, can cost tax-payers anywhere between two billion to eight billion dollars for one warship. That's not including the tens of millions of dollars it costs per year to man and operate the vessels. \$74.1 billion has been appropriated by Congress since the fiscal year of 2002 for the construction of new aircraft carriers, nuclear submarines, surface combatants, and amphibious vessels. However, \$8.3 billion of those dollars are to cover the cost growth of ships that were funded in prior years. (GAO, 2009). This leads to a reduction in the number of ships that the Navy can buy on its already constrained budget.

Government Support

To some capacity, the government has always supported the US shipping and shipbuilding industries. The government either gives grants to shipyards or passes legislation to try to sustain them. However, any legislation was usually only passed in response to something after the fact. In 1789, the US Congress put tariffs in place that gave preferential treatment to US-flagged ships that carried imported goods. Then in 1817, Congress enacted cabotage laws. Cabotage is the right to engage in domestic trade. The transportation of goods and passengers between two points within the same country. This can be across coastal waters, by a land, or by aircraft. The cabotage laws laid the foundation for what would later become the Jones Act. They also passed the Shipping Act of 1916 to try to quickly build as many ships for World War I. The Shipping Board, created by the Act, commissioned 1,700 ships, but the United States' participation in the war was so short lived that many of the ships weren't completed before the Armistice was signed in 1918 (McMahon, 2017). It wasn't until President Roosevelt passed the Merchant Marine Act of 1920 that the United States started taking having a strong merchant fleet seriously. The Merchant Marine Act was a law whose purpose it was to regulate maritime commerce in US waters and between US ports. What came as a part of the Merchant Marine Act was the Jones Act. For how important it is, the Jones Act is actually only a small part of the Merchant Marine Act, section 27. The section had to do with reestablishing coastline cabotage, making it so only ships that were built in the US, owned by a US citizen, flagged by the US, and operated by a crew of US citizens or permanent residents can move goods from a US port to a US port (Ashar & Amdal, 2014). With the vessels commissioned by the Shipping Board finished and more on the way thanks to the Jones Act, the United States ranked number one in the world

for ship building after World War I. They had the potential to become the world supplier for shipbuilding, but they didn't take advantage of this opportunity.

In 1936, President Roosevelt decided to take some initiative. Thanks to the reports written by the Black committee and the Interdepartmental Committee, President Franklin Roosevelt realized the importance of a strong merchant fleet and its need for governmental support. Roosevelt gave three reasons why it was important for the US to have an adequate merchant marine: to meet America's shipping needs during times of peace, during times of war when the US remains neutral, and during times of war when the US is involved (Gibson & Donovan, 2001). Because of this, he passed the Merchant Marine Act of 1936. This bill was similar to many of Roosevelt's New Deal plans. It aimed to stimulate employment as well as restructure an industry that has failed. This Act paid for the construction of an "adequate and well-balanced merchant fleet" that was owned and operated by US citizens. It established shipbuilding subsidy programs such as the Construction Differential Subsidy program and the Operating Differential Subsidy program. Lastly, the Act also created the U.S. Maritime Commission. (Gibson & Donovan, 2001). While the bill contained the kinds of compromises that are typical of any political legislation, the Merchant Marine Act of 1936 was an unrivaled legislative landmark in the history of US maritime policy. It was comprehensive, flexible, and was designed for long-term application. Its purpose was to promote the development and maintenance of an adequate and well-balanced American merchant marine. Thanks to the federal subsidies provided for the construction and operation of merchant vessels, 5,500 merchant vessels were created that would eventually go to support the war effort. By the end of the war, the United States controlled 70 percent of the existing merchant shipping tonnage in the world. (McMahon, 2017). Coming out of World War II, the United States had the largest, most

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powerful navy in the world with a strong merchant fleet to back it up. And again, the United States had the opportunity to become a global leader for shipbuilding, but they let it slip away. They passed the Ship Sales Act in 1946 and sold off many of their ships to foreign countries to help them rebuild. Because they let this opportunity slip, their merchant fleet immediately started to go in decline. Like other US industries, US shipbuilding started to face foreign competition in the post-war era. With the major powers recovering and the emergence of newly industrialized economies and flags of convenience, the US shipbuilding's health started to wane. Over the next two decades, their survival waxed and waned in proportion to the amount of government support they were given at the time. Support spiked for a moment in 1970 when the Nixon Administration passed the Merchant Marine Act of 1970, but it dropped shortly after that. The final nail in the coffin came in the 1980s when the Reagan Administration eliminated most of the subsidies rewarded to the industry. Ultimately, this is what put US shipbuilding in the sorry state it is today.

Reagan

Leading up to Reagan's presidency, the shipbuilding industry had been in a decline since the end of World War II. In the 1960s, the relationship between the industry and the government seemed to become increasingly contentious. The industry became ever more reliant on governmental protection and subsidies, while at the same time, the leaders of the industry seemed to have a preconceived notion that they were entitled to these crutches. The fleet of ships that was built during World War II were quickly becoming obsolete. With years of halfhearted bureaucratic efforts and several failed attempts by President Johnson to pass any kind of meaningful change to the industry, it took until the end of the decade and President Nixon to pass the partially successful bill of the Merchant Marine Act of 1970. A few new series of vessels,

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mostly crude oil tankers, were created under the Merchant Marine Act of 1970, but foreign competition and, surprisingly, the war between Israel and the surrounding Arab states caused the oil tanker market to collapse and essentially killed the programs created (Gibson & Donovan, 2001). The US shipbuilding industry was on the verge of a new decline and people were searching for a workable maritime program. Around this time, then governor Ronald Reagan was campaigning for the presidency. In 1980, while on campaign, Reagan gave a speech in front of an enthusiastic audience comprised of leaders in the maritime industry. In this speech, he announced his plans to revitalize the maritime industry. He called this proposal the “Program for the Development of an Effective Maritime Strategy.” His speech got the leaders very excited this proposal touched on almost every important issue in the US’s maritime policy. His plan was to

1. “Provide a unified direction for all government programs affecting maritime interests of the United States.
2. Ensure that the vital shipbuilding mobilization base was preserved
3. Improve utilization of military resources by increasing commercial participation in support functions
4. Recognize the challenges created by cargo policies of other nations
5. Restore the cost competitiveness of US flag operators in the international marketplace
6. Revitalize the domestic water transportation system
7. Reduce the severe regulatory environment that inhibited American competitiveness”

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(Gibson & Donovan, 2001, p. 256). These promises, while visionary, were pretty far-fetched. Reagan didn't mention the amount of money it would take to pay for these lofty goals or even how they would be implemented. All he knew was that he would need every vote he could get to defeat the incumbent president, Gerald Ford. The maritime industry and labor unions had previously given President Nixon vital support in the election of 1972. When Reagan was elected president, however, his administration had a very different tune in regards to the maritime industry. On the campaign trail, Reagan had had Martin Anderson as a longtime economic advisor. Anderson was very outspoken about opposing all government subsidies to any industry. When Reagan got elected, Anderson was appointed as assistant to the president for Policy Development (Gibson & Donovan, 2001). It also didn't help the industry when the Maritime Administration was transferred from being a part of the Department of Commerce to being a branch of the Department of Transportation. This meant that the Maritime Administration could no longer be the strong, forceful voice for the maritime industry. So, when the Office of Management and Budget, headed by Anderson's wife, decided not to try to obtain the annual appropriations for the subsidies to the maritime industry, including shipbuilding. The administration presented the hiatus from subsidies to shipbuilding as a response to budgetary shortfalls, but this was the beginning of the end for shipbuilding subsidies. The direct subsidy programs created by President Roosevelt in the Merchant Marine Act of 1936. It was apparent that this administration was not going to be as kind to the maritime industries as previous administrations had been before.

Drew Lewis, the newly appointed secretary of transportation during the Reagan Administration, had the job of constantly being the bearer of bad news to the maritime industry. Lewis had to tell the leaders of the maritime industry how their administration would be going

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back on the many promises that Reagan had made to the industry during the campaign trail. He was also the one who had to tell them that they would not be appropriating annual funds for the subsidies to the shipbuilding industry for the fiscal years 1982 and 1983 (Gibson & Donovan, 2001). Since there was going to be no subsidies coming for the shipbuilding industry, the government knew that US shipyards would not be able to construct commercial vessels for anything even close to regular market prices and they would not be able to replace their quickly aging fleet in time. So, in an effort to try and alleviate this issue, Congress passed the 1981 Reconciliation Act. This Act allowed for shipowners to purchase foreign-built ships, but only for the fiscal year 1982. Of course, this program really upset the American shipbuilders, but the American shipowners were very happy by this turn of events. Despite the small window, American shipowners used this opportunity to its fullest by commissioning thirty ships from foreign shipyards as well as having several other ships be refurbished overseas (Gibson & Donovan, 2001).

While it may seem like the Reagan Administration didn't care much for the maritime administration, that is not entirely true. They cared more for the Naval part of the maritime industry, not so much in the merchant part. In the midst of the Cold War where the Soviet Union dominated Central and Eastern Europe since 1945 and had begun to deploy thousands of intercontinental ballistic missiles, President Reagan was elected partially because of his pledge to restore US military superiority. Reagan had funded an unprecedented military buildup during peacetime. He was a strong believe in "peace through strength". However, Reagan didn't want to continue the policy of containment, to stop the expansion of the Soviet Union. His administration's policy was to undermine the Soviet's legitimacy and their capacity to dominate Europe. Reagan saw rebuilding America's military power, specifically as a maritime power, as

an important step to completing his objectives (Schneider, 2017). The Reagan Administration had spent billions of dollars on all branches of the military, developing new and more advanced innovations like the B-1B lance bomber and the Abrams tank, the Navy received the largest benefit of this expansion. Reagan had pledged to create a 600-ship navy. To do this, he expanded the budget for the military sealift from \$40 million in 1979, to \$1 billion by 1983. More than \$8 billion dollars was spent to buildup and modernize ships for the Ready Reserve Fleet (RRF) (Gibson & Donovan, 2001). This doesn't include the \$268 billion that was appropriated for the Navy under the Reagan Administration. While the Reagan Administration never reached the 600-ship fleet that they were hoping to, they did get very close. During his eight-year term, Reagan added seventy-one ships and an additional two aircraft carriers (Schneider, 2017).

Figure 1: Naval Modernization During the Reagan Administration, 1981-89

DATE	9/30/1981	9/30/1989
BATTLESHIPS	0	4
CARRIERS	12	14
CRUISERS	27	40
DESTROYERS	91	68
FRIGATES	78	100
SUBMARINES	87	99
SSBNS	34	36
COMMAND SHIPS	4	4
MINE WARFARE	25	23
PATROL	1	6
AMPHIBIOUS	61	61
AUXILIARY	101	137
SURFACE WARSHIPS	196	212
TOTAL ACTIVE	521	592

Source: *US Ship Force Levels, 1986-Present*

The Reagan Administration did, eventually, have to cut back on military spending due to political pressure to reduce the national budget deficit, which may be why they never reached

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their 600-ship fleet. While this naval build up did support the six US shipyards that were specialize in constructing warships, it did nothing to help the other US shipyards that only built merchant ships.

The rest of the Reagan Administration was just a series of false promises and exaggerated claims to the maritime industry. Secretary Lewis had made a proposal for a maritime program that wasn't nothing more than a wish list that everyone knew was too good to be true. One reason that main explain why the Reagan Administration didn't put much effort into the maritime industry was because they were more interested in fixing America's highways. They sought to improve America's highway system, improve trucking productivity, and to get rid of any outdated transportation restrictions. It is an area in transportation where the administration did have notable success. While his military spending did increase the size of the navy, it didn't last, budget cut backs and with no perceived threats to the United States after the collapse of the Soviet Union in the early 1990s, many of Reagans policies had to be either scaled back or abandoned all together, including the 600-ship fleet. Additionally, when the Reagan Administration decided to stop subsidizing US merchant shipbuilders, they did so without any similar actions taken by other shipbuilding countries. This means that while the American shipbuilders had to walk on their own two feet, foreign shipyards were being heavily subsidized by their country. The shipbuilders knew that they could not compete with foreign shipyards and they could not expect the rest of the world to get rid of their shipbuilding subsidies, so they began to campaign to bring back US shipbuilding subsidies. To the shipbuilders' surprise and dismay, the Clinton Administration was actually able to convince foreign shipbuilders to agree to stop directly subsidizing shipbuilding. However, this isn't what the American shipbuilders actually wanted. They wanted to be subsidies, so they quickly flipped their message. They

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desperately campaigned against the ratification of this agreement. They were successful and worldwide subsidies continued like it had before, but now American shipbuilders had lost their credibility. This caused business to begin to shift, first moving to Japan, then to South Korea and China.

Foreign Competition

Global shipping carries approximately 90 percent of world trade. 50,000 merchant vessels registered to over 150 different countries with over a million mariners of every different nationality manning the ships, carrying every kind of cargo imaginable. With current global trends, it seems likely that shipping will continue to be the primary means of transportation for cargo. With all that, approximately .1 percent of international shipping is carried by US flagged vessels. Even around 97 percent of the United States' imports and exports are carried by foreign vessels (McMahon, 2017). Before World War II, the shipping and shipbuilding industries were largely concentrated in European countries, with the United States just recently beginning to play a major role in those industries. Then, after World War II, the United States was the dominant commercial shipbuilder in the world. However, what Europe and the United States didn't expect was the rise of the Far East. It started as a gradual shift, first Japan, and eventually South Korea, started to carve out a powerful position for themselves in the shipbuilding industry. The former dominant players in the industry were hobbled by the outdated policies and could not compete with this quickly developing new world maritime industries.

The world has seen the rise of new shipbuilding giants as many countries have seen how critical a strong shipbuilding industry is to their national security. Many countries have poured billions of dollars into developing their shipping fleets and used liquefied natural gas (LNG) carrier ships as an opportunity to better develop their technologies and capabilities. Japan was

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the first of the new shipbuilding giants. Before World War I, Japan was one of the highest ranked shipbuilding nation in the world. They had invested in new equipment and sold shipyards to private companies. During World War II, the government took control of the shipbuilding industry and mainly build ships for military use only. After World War II, Japan focused on rebuilding many of its industries that would help them to recover economically. Shipbuilding was one of those industries. Even though they had limited access to necessary supplies, Japan's shipbuilding industry recovered surprisingly quickly. Similar to other export led economies, Japan enticed business by promising low-cost production and a superior product. In only a few short years, Japan was eventually able to surpassed their previous peak production. They were able to do this by importing foreign equipment and technology. Even with a few ups and downs over the decades, Japan has been consistently ranked number one in the world in terms of ship tonnage produced. They've been able to do this by subsidizing their shipbuilding industry, high-value tonnage, and designing new advanced ships that can meet the rising environmental and fuel efficiency needs (Willumsen & Tutturen, 2014).

Today's global suppliers for shipbuilding are South Korea, China, and Japan. In recent years, the title for leader of global shipbuilding has been switching between the three. Today, Japan, the world's second largest shipbuilding country, builds around 300 ships a year, not including those for its domestic use. Japan has more than a thousand shipyards across the country while China has more than two thousand (Paris, 2018). This in contrast to the United States 8 shipyards making 4 to 5 ships a year. These countries are able to build more commercial vessels a year than the United States has in its entire merchant fleet. But why is that? Save for maybe China, South Korea and Japan have similar economies. They're workers are paid around the same and they have to pay the same amount for materials. So why is it cheaper to build there? As

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previously mentioned, most foreign shipbuilding countries still subsidize their shipyards. The amount of how much South Korea subsidizes its shipyards is staggering. They subsidize so much that Japan, who also subsidizes, began to complain that South Korea is giving their shipyards too much money. In 2015, the South Korean government allegedly gave their shipyards 25 trillion Korean won. That comes out to 22 billion USD (Savvides, 2017). Also, these countries mass produce the same type of vessels, while the US specializes their vessels. The US likes to modify their vessels while they are being built instead of before and that drives the costs even higher.

Jones Act

Any time the topic of American shipbuilding is studied and talked about, it inevitably ends up on the subject of the Merchant Marine Act of 1920, also known as the Jones Act. In its inception, there were three main goals for the Jones Act. First, it established the Merchant Marines which was meant to ensure that the US would have a fleet of ships that could care for domestic and foreign commerce to and from US ports. Second, it established sea lift capacity. This means that in a time of war or emergency, the US Navy could call upon these merchant ships to support the war effort by carrying necessary supplies to US positions. Finally, the third goal of the Jones Act was to maintain the ship building and maintenance capacity of the US. In order to accomplish these three goals, the act requires US carriers to restrict domestic shipping to vessels who were built in the United States and never rebuilt in a foreign place, are flying the US flag, the ownership of these ships must be at least 75% by US citizens, are employing a crew who are US citizens (or permanent residents), and are managed by US citizens (Kashian, 2017). The Jones Act provides protectionism to the Merchant Marines and the shipbuilding industry by creating a “coastwise monopoly.” This law has no effect on the foreign trade of the United States. These domestic shipping vessels are the only ships allowed to transport goods from a US

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port to another US port. A foreign flagged ship can move from one American port to another without any real restriction. They enter into a US port to drop off imported cargo that was loaded at a foreign port and they can pick up US products from the US port to take that back overseas to a foreign country.

The Jones Act, despite all the controversy, has not always been a bad thing. The Jones Act was actually the only thing that protected the US shipbuilding industry in 1973 when the market collapsed. When the tanker industry collapsed because of the war between Israel and the surrounding Arab nations, many European shipbuilders went out of business, but the Jones Act was able to keep US shipbuilders working. However, the shipbuilding protectionism comes at a cost. The capital and operating costs for the US is much higher than that of other countries that don't have any such cabotage laws (Cope & Woosley, 2018). This has put the US shipbuilding industry at a disadvantage compared to foreign manufacturers and we can see that with the decline size of the US shipping fleets.

The Jones Act is one of those cases where it is meant to protect an industry, but, that same legal protection meant to protect and nurture American shipping ended up contributing more to its decline. The Jones Act was meant to maintain the health of the commercial shipbuilding, but with as continued decline has shown that in its current form, it has failed and will continue to fail unless something changes. There are those who hate the Jones Act. The late Senator John McCain was one of those people. He vowed to repeal the Jones Act and tried multiple times to do so. In 2017, the Senator McCain attempted to get an amendment passed in the Senate that would repeal harmful portions of the Jones Act. Senator McCain had been advocating for the repeal of the Jones Act for a long time. He said that the Jones Act was an archaic and burdensome law. However, Senator McCain wanted to repeal the Jones Act more

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because of the impact it had on the economy and the impact on the American consumers rather than the Merchant Marines or the shipping or shipbuilding industries. Senator McCain saw the Jones act as a hindrance on free trade that stifled the economy and harmed the consumers (McCain, 2017). The Jones Act causes the price of gas to rise, it can hamper a lot of US infrastructure improvements, and it causes the cost of living in noncontiguous states like Hawaii, Puerto Rico, and sometimes Alaska to be extremely high. The legislation that McCain wanted to pass would eliminate the regulation that required American shipowners from having to buy American made ships. This would allow US shipowners to purchase the less expensive foreign-made ships, reducing the cost of shipping, then allowing American farmers and businesses to be internationally competitive. Eventually, leading to lower costs on good and services for American consumers (McCain, 2017). He tried four different times during his career, but all of Senator McCain's attempts to repeal the Jones Act failed.

Like all controversial acts, the Jones Act has its winners and its losers, but the fact of the matter is: The United States absolutely needs the Jones Act. There are a few important reason why the Jones Act is necessary. First, if the United States were get rid of the Jones Act and the Merchant Marine and rely on hiring foreign-flagged vessels with a foreign crew and the US were to engage in a "hot war" and this vessel were to take fire, the ship could refuse to carry the cargo into a conflict zone. It has happened before. There were times during the Gulf wars when foreign-flagged vessels did refuse to deliver cargo. Second, there may be times, either for political or economic reasons, when the US cannot charter ships. If there was a war, a country ay decided to not charter the vessels to the US so not to offend an ally.

It is in the interest to keep the Jones Act in order to keep the Merchant Marine alive and have a shipbuilding industry. Without it, American shipbuilders would have to compete in the

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global market with South Korea, Japan, and China. They wouldn't last a day. With shipbuilding gone, the Merchant Marines would likely go with it unless the United States suddenly decided to started buying solely foreign-built ships. The point here isn't to make American shipbuilding internationally competitive, the point is too get the industry to a place where it can properly meet the needs of the United States. Amending the Jones Act and bring it into the 21st century would be a step in the right direction.

Operation Desert Shield/Storm

August 2, 1990, Iraqi tanks roll across the desert border into the neighboring country of Kuwait. Saddam Hussein takes control of the country's petroleum rich oil fields that were essential to the economies of Europe, Japan, and the United States, sets up a puppet government called "Republic of Kuwait" and, eventually, annexes the country, beginning an occupation that lasts seven months. Global outrage was swift. The world realized that Saddam now had control of 20% of the world's oil production and many feared that with how easily Iraq had been able to conquer Kuwait, it might encourage Saddam to become even bolder. With the Iraqi army camped near the Kuwait-Saudi Arabian border, many feared that Saudi Arabia would be next on Saddam's list. America now faced a new strategic dilemma. During the Cold War, the United States was able to respond to quickly and contain their enemies thanks to bases near the location. They had bases in Germany to contain the Soviets in Eastern Europe, bases in Japan to stabilize Korea, as well as naval and air force bases for any problems that arose in the Far East. However, at the time, the United States didn't have any bases in the Middle East. The invasion of Kuwait then became a test of how quickly the United States could respond to a situation where sealift plays a crucial role. Turns out, they are not quick enough.

President Bush went before a joint session of Congress to basically lay out the plan of attack. With the Iraqi ambassador present, Bush told the audience that Iraqi will not be allowed to annex Kuwait and issued orders to begin Operation Desert Shield. The orders were for American troops to prepare to join in an international coalition of more than 20 different nations to remove Iraqi forces from Kuwait if Iraq did not meet with the United Nation's deadline that all Iraqi forces must withdraw from the region by January 15. Of course, Iraq did not comply with this deadline, so on January 17, the US led coalition began an aerial and naval bombardment of Iraqi forces for five weeks. On February 24, the almost one million coalition troops began a ground assault from the Saudi-Iraqi border. After 100 hours of the ground assault, the coalition forces halted their advance and declared a ceasefire (History.com, 2018).

Now, that sounds like a happy ending, and it is, but its only because the United States got very lucky, it could've been much worse. First, Iraq invaded Kuwait in August 1990, the US led coalition didn't respond until January 1991. Iraq occupied Kuwait for seven months before the United States could respond. If Saddam Hussein had been so inclined, he could've invaded Saudi Arabia within that time and the US would have been helpless to stop them. Without the modern ports of Saudi Arabia, the coalition forces would've had trouble even landing. But, since Saddam didn't invade Saudi Arabia, possibly because he thought that maybe he could get away with just taking Kuwait, the coalition could move in and claim a brilliantly executed and swift victory. But, if anything had been a little bit different, the inadequacies of America's sealift capabilities would have proven disastrous. While the United States had gained a sizable Ready Reserve Fleet thanks to the Reagan Administration, they were very underfunded and very understaffed, also thanks to the Reagan Administration. When the Navy went to activate the RRF for Operation Desert Shield/Storm, they found that many of the ships hadn't been regularly tested for

activation readiness. In fact, more than half of the ships hadn't been tested since they became a part of the RRF (Gibson & Donovan, 2001).

As if the fact that only half of the RRF could be activated for Operation Desert Shield/Storm wasn't bad enough, it turns out that the Maritime Administration was also facing a major shortage of qualified seamen. No one had bothered to set up a reserve system for mariners. Those who responded to the call to action literally had to leave their jobs. MARAD had to pull mariners from retirement and brought sailor that were on leave so the ships could be manned (Gibson & Donovan, 2001).

Another issue that has occurred not just during Operation Desert Storm and Desert Shield but has plagued the Navy for many other operation is the fact that the United States doesn't have enough Roll-on/Roll-off ships, also known as Ro-Ro ships. Because of the current containerized cargo system, it is difficult for the military to transport the weapons and supplies they need to where they are needed and not where it would be more convenient. In most cases, the military needs to get these supplies to a country that doesn't have or have less than adequate shoreside facilities to unload this equipment. This is why they prefer Ro-Ro ships. They are designed to carry wheeled cargo. This includes things like trucks, trailers, and tanks.

With not enough ships or mariners in the RRF, the United States had to charter more than one hundred foreign-flagged ships. Almost every ship in the world that was able to transport heavy equipment was being chartered. It's not entirely the US's fault. The US had formed a coalition to invade Kuwait, but none of its allies were providing ships to move war material (Gibson & Donovan, 2001). So what can be learned from Operation Desert Shield/Storm. If there were an international emergency where the United States was required to activate all of the RRF, the results would likely be disastrous. The United States' sealift capabilities were in a

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similar situation to what they are in today. They are underfunded, undermanned, and not very well maintained. There is a reason why maritime powers throughout history have maintained a national merchant marine, it was so they would have enough qualified mariners to man the ships when they are called into service. Not to mention the age of the ships today are well passed the industry standard, so it's questionable if they would even start when activated. With the shape that the shipbuilding industry is in, they cannot repair the old ships, nor are they able to replace them.

Trump

During the 2016 presidential campaign, then presidential candidate Trump made a big promise during a visit to a Philadelphia shipyard. If he were to be elected President, then he and his administration would have a fleet of 350 surface ships and submarines constructed. His proposal would see the launch of the largest build-up the US Navy has seen in 30 years, since the Reagan Administration. During the 2016 election, the navy had approximately 282 deployable battle force warships. That is a drastic decline from the 1,600 ships that the Navy had at the end of World War II. While this is still more ships than any other country in the world, by a considerable amount, the fleet is smaller than it has been in a hundred years. It is likely that many of those shipyard worked ultimately voted for Trump since he won Pennsylvania and the presidency.

In 2016, under the Obama administrations, the navy already had plans that was looking at being able to achieve and maintain a fleet of 308 ships. The Navy's 308-ship force-level goal was a part of the Navy 30-year shipbuilding plan. The Navy came up with the number 308 by looking at their 2014 force structure assessment that found that 308 was the most achievable number at the time. The Navy projected that if they were to fully implement their 30-year

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shipbuilding plan, they would be able to attain their fleet of 308 ships by the fiscal year of 2020, a year faster than the Bush administration's previous goal of 2021 (O'Rourke, 2016). The call for a fleet of 350 ships has actually been around a while. 350 is a rounded-up version of a recommendation that was a part of a report from a National Defense Panel in 2014 that called for a fleet up to or more than 346 ships. Those who have been advocating to increase the size of the Navy to more than 308 ships point to three growing issues. They are worried about China's naval modernization projects, the resurgence of Russian naval activity, and the challenges that the Navy is facing while trying to deploy ships where they need to be (O'Rourke, 2016). These worries have been echoed by Trump, however, it is difficult to determine whether or not President Trump will be able to keep his campaign promise of a 350-ship fleet. While the Navy will grow by more than 40 ships in the near term, it is likely that after this the number of ships being built will begin to sputter out.

Since taking office, President Trump has upped the number of ships from 350 to 355. As of November 2018, the US Navy has 286 warships. If Trump were to seriously attempt to build a fleet with 355 ships, he would need to also replace the aging ships. There are also plans for the Navy to modernize many 17 of its 22 cruisers that have past their 35 year service life (Larter, 2018). It is unclear how this modernization program will affect the plans for the retirement of these ships, but if he were to replace the old vessels and build the amount of ships to reach 355 ships, he'd have to build nearly 30 vessels per year, on average. At this point in time, the shipbuilding industry could not do this. That is not to say that Trump shouldn't try and increase the number of ships. In fact, this would greatly improve the state of the shipbuilding industry and the Navy. The way that the navy has been slowly shrinking over the years has hurt the shipbuilding industrial base as well. With less ships being constructed, the number of shipyards

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and suppliers have also been decreasing. This is why when Trump promised to build a fleet of 350 ships, the shipbuilding industry was on board. Leaders of the industry were encouraged by the administrations interest in the shipbuilding industrial base. However, even with the support of the industry, it would take a long time, at least 25 years with a modest increase in production, and a lot of money, approximately \$120 billion, to add an additional 70 ships to the Navy. If Trump is able to reverse the shrinking of the Navy, it would not only bring back thousands of well-paying blue-collar jobs, but it would give back the Navy's the ability to maintain their presence in hot zones around the world.

Trump's FY19 budget does give a relatively modest increase in the budget for shipbuilding. This increase will likely give the navy the ability to reach at least 326 ships by 2023. An increase 44 ships over the next five years. With their new 30-year shipbuilding plan under the Trump administration, the Navy will be able to reach the Obama's administration's by 2020, a year earlier than the goal that the Obama Administration had set. After that, by the end of the five-year future defense plan, the Navy should be able to build an additional ten more ships, bring the total to 326 ships, ten more than the Obama administration had projected for the same timeframe (Larter, 2018). When the Navy reaches its goal of 326 in 2023, it will mark the peak point that will be achieved under the current plan. After that, there will be a large number of ship retirements that will begin in 2024 that will decrease the Navy's size again. It is projected that this slew of ship retirements will bring the fleet's size down to between 313 or 315 ships. This will likely last for a number of years until the 2030s where it is believed that the numbers will begin to rise again (Larter, 2018). In the end, the Navy won't get close to Trump's promise for a 355 ship fleet. With the current 30-year shipbuilding plan, the highest projected number is 342 ships by 2039.

Energizing American Shipbuilding

There has to be some effort on the part of Congress to save the shipbuilding industry. Most recently, in May of 2018, there was a bipartisan bill that was introduced to Congress called the Energizing American Shipbuilding Act of 2018 that looks to revitalize the shipbuilding industry by constructing roughly fifty Jones Act vessels as well as the creation of thousands of jobs in the maritime and mariner industry. There has been an increase of liquefied natural gas (LNG) exports coming from the United States since 2015 and with current global trends, this is likely to increase. Some projections show the US becoming the third-largest producer of LNG exporter in the world. The amount of crude oil being exported could reach as high as 3.64 million barrels per day by 2025. With these quickly growing markets, there will have to be enough ships to carry these exports. It would require around 100 or more ships to carry the LNG and anywhere between 180 and 380 oil tanker (Garamendi, 2018).

The ships that would be built by the Act would be mainly used for handling the fast-growing US LNG exports, which the US merchant fleet currently has zero ships that can carry the natural gas. With this bill, the United States has the opportunity to take advantage of the growing LNG and crude oil exports to not only build new ships, but to increase and expand the shipbuilding industrial base. The bipartisan bill projects to build these ships by 2040. It will lead to the strengthening of US strategic interests and alliances with its trading partners because they will once again be able to put their trust in the reliability of the US flag. If the United States won't take advantage of this, the rest of the world will. The world sees the increasing need of LNG carriers and storage vessels. It is expected that there will be around 225 LNG vessels added to the worldwide fleet by the end of 2020. Currently there are 125 LNG carriers and storage vessels that have been commissioned with another 100 ships projected to be commissioned

between 2017 and 2020. Zero of those are being built in American shipyards. More than seventy percent of these orders have been given to South Korean shipyards (Margaronis, 2018).

By passing the Energizing American Shipbuilding Act, the United States has an opportunity to reinvigorate their shipbuilding industry and domestic maritime industry. US shipyards and the Merchant Marines will benefit from this bill and will be able to further serve US national security and public interests. The bill will launch a large LNG shipbuilding program and a crude oil shipbuilding program. It requires that a significant portion of the material used to construct the ship – Iron, steel, and manufactured components – be sourced and constructed in the US. It will also provide a program that will require that exporters immediately provide American mariners training opportunities aboard export vessels. That way, they can gain the credentials needed for these jobs. The bill also has a section that deals with the transportation of the natural gas and crude oil. This section requires that a certain percentage of US LNG exports travel on American-built vessels. IT will start off at just two percent in 2024, then it will be increased to fifteen percent by 2040. It does the same for crude oil except at a lower rate. In 2023, only one percent of the US crude oil export is required to be carried by American-built crude oil carriers, then it increases to ten percent by 2032 (Garamendi, 2018). It is estimated that with the addition of fifty US-flagged ships, that the bill will create over 2,000 mariner jobs, not including thousands of jobs at the shipyards and steel-related manufacturing jobs, by 2040. However, despite the bill not only being bi-partisan, but bi-cameral, as well as supported by numerous maritime organizations, it is unlikely that the bill will gain any traction due to the high cost of constructing, maintaining, and operating such vessels. It all comes down to the cost. It's the reason why the United States no longer subsidizes shipbuilding and why until someone convinces Congress that we need bold strokes, nothing will change.

What Can Be Done?

Fixing the Shipbuilding industry is not a one-step solution. It will take the efforts of all levels of the industry and government and take many years to even get it at an adequate level, but it is something that must be done. One of the place that the improvements to the shipbuilding industry has to come from is the top. Change can't come from the bottom. Congress would have to take up the cause of fixing the shipbuilding industry. There are a number of reason why the US should be working toward fixing the industry and most of them are in the name of national security. People in the military see that the United States has an issue with their sealift capabilities. It is something that keeps them up at night, knowing that if crisis were to strike that they would not have enough ships to transport their men and supplies across the sea. Today, threats tend to appear much more quickly than they did a century ago. The United States won't have a warning to start building ships. The United States' ability to meet and counter future threats will depend upon having a sufficient number of ships that can respond quickly to the threat. As previously mentioned, Operation Desert Storm and Desert Shield are prime examples of the United States' sealift inadequacies. During these operations, navy cargo ships averaged 100 lift-hours per day. They moved hundreds of thousands of passengers, 3 million of tons of equipment and supplies, and 4.2 million tons of fuel. During this time, MARAD owned virtually all of the vessels, 78 of the 102 ships at the time. However, this still wasn't enough. The US had to charter 177 foreign flagged ships from friendly and allied nations. These foreign flagged ships carried about 26.6 percent of the equipment (Crenshaw, 2017). The United States may have the best military equipment and most well trained soldiers in the world, but without its sealift capacity, it won't do them any good if they can't get them to where they need to be. Having to

outsource their security and control of their supply chains is a danger to the United States' national security.

Mainly, the United States needs to consider amending or replacing the Jones Act. The Jones Act is a relic of a different time and in its time, it did its job well. However, today, it is only doing harm, not only to the shipping and shipbuilding industries, but effects almost all other commercial industries as well as the economies of non-contiguous states. The Jones Act was intended to ensure that the US's commercial shipbuilding industry stayed healthy and prosperous, but the fact that the US merchant fleet is shrinking shows that the Jones Act has failed in that regard. Since 2010, the merchant marine has seen a net loss of 52 US-flagged oceangoing commercial ships. This has then brought about the loss of approximately 2,300 mariner jobs, which the pool of qualified mariners is already barely sufficient enough to meet the estimated needs of the US Transportation Command (Garamendi, 2018). The merchant marine is supposed to be defined as a commercial fleet that flies the American flag and is employed in carrying its international trade, but due to regulatory restrictions, the US merchant marine cannot be internationally competitive. Talking about the Jones Act is a very divisive issue. Either side tends to talk in absolutes: either it needs to be gotten rid of completely or is fine as it is. Proponents of the Jones Act say that it is important for national security, but it has already been shown that it has failed in that regard as well. The merchant marine is supposed to be the America's "fourth arm of defense", but they've shriveled to a shadow of their former selves. Multiple studies have shown the economic cost of the Jones Act. They have found that if the United States were to repeal the Jones Act, it would have an overall positive impact of \$656 million annually on the US economy (Frittelli, 2003). However, there are those who argue that the Jones Act isn't actually needed for national security and, additionally, that the Merchant

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Marine isn't needed. They will point to the fact that most American manufacturing industries provide vehicles and equipment for the military and yet they don't have any laws like the Jones Act for them. They say that with or without the Jones Act, the shipbuilding industry will continue to provide the Navy with vessels. They use the case of Operation Desert Storm and Desert Shield as proof that the United States doesn't need a merchant marine because they can just charter ships that are foreign-flagged. The idea to just constantly lease foreign vessels to meet the United States' sealift capacity is in no way cost-effective in the long term. Their response to that would be that the military should just purchase the vessels outright. This then circles back to the main point the Jones Act, to preserve the American shipping and shipbuilding industries. Sure, getting rid of the Jones Act may give save the government an additional \$656 million annually and save the American consumer some money, but these two industries contribute billions more to economy and employ hundreds of thousands of people both directly and indirectly. There is more to gain from amending the Jones Act to try and alleviate the cost burden on noncontiguous states then just removing the Jones Act in its entirety. The best thing to do, in the short-term, is to allow for some ships to be purchased that were foreign-made and just have them be manned by an American crew.

Conclusion

Change won't come over night. In fact, it would probably take several decades to get both the shipping and shipbuilding industries back on their feet. If they were to try and fix the industry overnight, it would probably end up hurting it more while costing the US government billions. History has already shown us this. In the 1990s, the United States tried to revitalize their cruise ship constructions after it had been dormant for 40 years. This was a \$1.1 billion failure. The UK had a similar problem with their submarine industry that had been put on hiatus for ten

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years. They almost completely lost the industry due to technical, operational, and cost problems until the United States decided to help them out (The Eisenhower School, 2017). This is one case where the United States has actually seen the harm it could cause and decided to learn from it. Which is why the US Navy has done its best to make sure that they have more than one submarine builder. These industries are like a person who has been starving for a long time. If you give them too much food too quickly, it will end up hurting them, maybe killing them. So if one were to try and fix the industry, they would need to come up with a stable, long-term shipbuilding plan. But something must be done. The lack of interest and the unwillingness to reform US maritime policy has ended up causing the industry to wither away and die.

There are two realities that must be recognized and accepted because no matter how much effort is put into saving these industries, these will remain true. First, federal funding for the maritime industries will likely never be as big as it once was. In the past, the threats of war and foreign aggression were what kept the political support for the maritime industries so strong. But, after the collapse of the former Soviet Union, there is no longer the desire to restore these industries to their former glory, and it is unrealistic to think that it will happen. Second, with the current way that international trade has developed, the idea of national identity of maritime transportation has become blurred. A ship can be built in one country, owned by another, crewed by diverse crew, then flagged by a different country. So no matter how much political effort and protectionism, it will not change the fact that Americans that operate in international trade will want to buy or charter ships that are flying flags that are not the United States. The world is changing, and America's maritime policies will have to change with it.

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