



# NAVAL POSTGRADUATE SCHOOL

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## MBA PROFESSIONAL REPORT

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**A Stakeholder Analysis of the  
Navy's Thirty-Year Shipbuilding Plan**

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**By: Patrick Ryan O'Loughlin  
December 2007**

**Advisors: Philip Candreva,  
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**A STAKEHOLDER ANALYSIS OF THE NAVY'S THRITY-YEAR  
SHIPBUILDING PLAN**

Patrick Ryan O'Loughlin, Lieutenant, United States Navy

Submitted in partial fulfillment of the requirements for the degree of

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from the

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# **A STAKEHOLDER ANALYSIS OF THE NAVY'S THRITY-YEAR SHIPBUILDING PLAN**

## **ABSTRACT**

Using a stakeholder management approach, this thesis helps the U.S. Navy understand who the external stakeholders are with respect to the Thirty-Year Shipbuilding Plan, the priority of differing stakeholder claims, and the nature of the U.S shipbuilding industry, one key stakeholder group. By citing the over-arching goals of the Navy's shipbuilding plan, reviewing Congressional testimony and reports on this plan, and financial analysis of individual shipbuilding firms, this thesis discerns key facets that explain shipbuilder behavior. To better manage shipbuilders, the Navy should develop strategies that refine shipbuilding business cases by stabilizing production rates, achieving greater design stability, and reducing order intervals.

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## **EXECUTIVE SUMMARY**

Applying R. Edward Freeman's (1984) stakeholder analysis process to the U.S. Navy's Thirty-Year Shipbuilding Plan, this thesis identifies key stakeholders, defines and provides an explanation for their current behavior, and proposes an independent stakeholder strategy the Navy can apply that helps manage one key stakeholder group, shipbuilders.

In identifying stakeholders of the Navy's shipbuilding plan, Freeman's first step, this thesis uses Frooman's (1999) application of resource dependence theory to stakeholder analysis. Two key stakeholder groups emerge, Congress and the tier one shipbuilding firms, Northrop Grumman Ship Systems and General Dynamics Marine Systems. Focusing on only one stakeholder group, shipbuilders, this thesis reviews recent Congressional testimony from these firms and the American Shipbuilding Association, an industry trade group, to identify their current behavior, the second step in Freeman's process. One key concern is instability in the shipbuilding industry. Both the Government Accountability Office and Congressional Research Service corroborate this concern.

Freeman's third step is to explain stakeholder behavior. Michael Porter (1980) provides a method to understand the competitive forces in an industry. This thesis analyzes those forces in the U.S. Shipbuilding industry. It also examines the financial and labor pressures under which these firms operate.

The relationship between the Navy and shipbuilders is one of mutual dependence. As such, this thesis recommends using a collaborative strategy to manage shipbuilders. This strategy entails adopting the June 2007 GAO recommendations that call for the Navy to use better business cases for shipbuilding programs. These improved business cases will increase stability in the industry. Additionally, the Navy should maintain year-to-year stability in the shipbuilding plan with the number of ships it proposes to build. With stability in the industry, firms will be able to lower costs and provide the Navy with ships at a lower price.

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## I. INTRODUCTION

Christopher Cavas (2007) reports in the Navy Times that Northrop Grumman received a “scathing rebuke” from Secretary of the Navy Donald Winter for its performance building USS SAN ANTONIO (LPD 17), the first in a new class of amphibious warships. In a letter to the chairman of Northrop Grumman, he criticized the company for an inability to meet schedule and cost targets and poor construction standards (Cavas, 2007). The Navy accepted LPD-17 with numerous outstanding deficiencies. In the same letter, Secretary Winter wrote, “By taking delivery of ships with serious quality problems, the Fleet has suffered unacceptable delays in obtaining deployable assets. Twenty-three months after [the] commissioning of LPD-17, the Navy still does not have a mission-capable ship” (Cavas, 2007, ¶5). Additionally, Secretary Winters stated he has grave concerns about other ships the company is scheduled to build, including the Zumwalt (DDG 1000) Class destroyer and the LHA-6 class amphibious assault ships (Cavas, 2007).

One aim Admiral Mike Mullen, Chief of Naval Operations, had with the first shipbuilding plan released during his tenure was to stabilize the shipbuilding industrial base. This stabilization would allow both the Navy and industry to plan efficiently (Department of the Navy, 2007). Additionally, he wanted a single number of battle force ships to meet the Navy’s operational requirements. The answer was a 313-ship Navy (CBO, 2006). But as the aforementioned situation between Northrop Grumman and the Secretary of the Navy highlights, these goals are in jeopardy. How can the Navy ensure that the goals set forth in their shipbuilding plan are achieved?

This thesis will use stakeholder analysis literature to conduct a stakeholder analysis of the U.S. Navy’s Thirty-Year Shipbuilding Plan. Stakeholder analysis has proven itself to be a valuable tool to understand an organization’s external environment. Understanding this external environment will aid the U.S. Navy in understanding the motivations of private shipbuilding firms, Congress, and other stakeholders. While the Navy seeks approval of this plan, external stakeholders seek to influence and change the decision that Congress will ultimately make. Based on this external stakeholder

understanding, the U.S. Navy can develop an integrated stakeholder strategy to gain approval of its proposed Thirty-Year Shipbuilding Plan and achieve their desired Fleet.

## **A. RESEARCH QUESTION**

The primary research question this thesis answers is what can the U.S Navy learn about its external environment with respect to the Thirty-Year Shipbuilding Plan using stakeholder analysis research? In so doing, this thesis answers four supporting research questions:

1. Who are the U.S. Navy's external stakeholders in regards to the Thirty-Year Shipbuilding Plan?
2. What is the salience of those external stakeholders?
3. How are shipbuilders currently behaving?
4. Why are shipbuilders behaving in this manner?

## **B. METHODOLOGY**

The methodology used in this thesis will follow the process in R. Edward Freeman's 1984 stakeholder analysis work *Strategic Management: A Stakeholder Approach*. This process begins by defining who a firm's stakeholders are. In defining a firm's stakeholders, Mitchell, Bradley, and Woods (1997) narrow Freeman's definition and suggest examining a stakeholder's salience, i.e. the possession of three key attributes: power, legitimacy, and urgency. By determining stakeholder salience, a firm can see who its stakeholders are and the ability of each to bring pressure against the firm or aid the firm through cooperation.

Next, Freeman suggests a firm analyze the behavior of its stakeholders to determine its cooperative potential and competitive threat. Thirdly, a firm should view the issue through the eyes of the stakeholder, explaining that stakeholder's behavior by understanding the pressures under which that stakeholder operates. Finally, Freeman suggests generic strategies a firm can use in order to develop an integrated stakeholder program.

This thesis draw on publicly available data including, but not limited to, Congressional testimony from the U.S. Navy and American Shipbuilding Association, Congressional Research Service reports, Government Accountability Office reports, Congressional Budget Office reports, shipbuilding firms 10-K reports filed with the Securities and Exchange Commission, and reports from various think tanks.

### **C. SCOPE**

In order to keep this thesis manageable, it only examines the behavior of one stakeholder group in detail, shipbuilders. Shipbuilders include the “Big Six,” which build 90 percent of the Navy’s vessels. Northrop Grumman Ship Systems owns Avondale, Ingalls Shipbuilding, and Newport News. General Dynamics Marine Systems owns Bath Iron Works, Electric Boat, and National Steel and Shipbuilding Company (NASSCO). Because these yards do very little commercial construction, this thesis does not address the global commercial shipbuilding industry. This thesis also limits itself to using only information available to the general public. This thesis will not develop an integrated stakeholder strategy, the final step in Freeman’s process.

### **D. RESEARCH BENEFITS**

An external stakeholder analysis of the Navy’s Thirty-Year Shipbuilding Plan provides Navy managers an accurate picture of who their stakeholders are and each stakeholder’s salience. This research provides a detailed examination of one key stakeholder, shipbuilders, and proposes an individual stakeholder strategy to manage this group. An understanding of this external environment can also help Navy managers make more informed program decisions.

Additionally, this thesis lays the foundation for future researchers to continue Freeman’s stakeholder analysis process through detailed examination of other external stakeholders and development of a larger integrated stakeholder strategy, thus completing Freeman’s process. Effective management and execution of this strategy will aid the Navy in its ultimate goal of attaining a fleet of 313-ships.

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## **II. BACKGROUND**

### **A. THE U.S. NAVY'S THRITY-YEAR SHIPBUILDING PLAN**

Orders for warships declined 60 percent during the ten years since the end of the Cold War (Bureau of Export Administration, 2001). Since the start of the 21st Century, the Navy has had a total of four shipbuilding plans each stating a different total of battle force ships. In 2001, the Quadrennial Defense Review called for a 310-ship Navy. From 2002-2004, the Navy proposed a 375-ship fleet. In March 2005, the Navy submitted a shipbuilding plan calling for a fleet of between 260-325 battle force ships (Congressional Research Service, 2006).

The fourth iteration came in the summer of 2005 when the new Chief of Naval Operations, Admiral Michael Mullen, ordered a reexamination of this plan in order to accomplish two goals: 1) arrive at a single numerical fleet requirement and 2) provide stability in year-to-year construction of naval ships so that both the shipbuilding industry and Navy could plan more efficiently (Congressional Budget Office, 2006). The Navy submitted its new plan in February 2006, settling on a permanent number of 313 battle force ships, keeping in mind that the actual number of ships would rise and fall depending on commissioning and decommissioning schedules and based on what budgetary resources Congress appropriated for purchasing new ships (Congressional Budget Office, 2006). In keeping with Admiral Mullen's goals, both the 2007 and 2008 plans call for a 313-ship fleet, while the mix of ship types fluctuated from year to year.

In terms of the composition of the 313-ship fleet, the FY 2008 plan calls for 11 aircraft carriers, 69 guided missile destroyers, 19 guided missile cruisers, 55 littoral combat ships, 48 attack submarines, 4 guided missile submarines, 31 amphibious ships, 12 future maritime pre-positioning ships, and 50 logistics and support ships (Congressional Budget Office, 2007).

## **B. THE U.S. DEFENSE BUDGETARY ENVIRONMENT AND THE SHIPBUILDING PLAN**

In 2006, the GAO released a report describing challenges to the Navy's shipbuilding plan. One challenge cited is the increasing demands on discretionary dollars, from which the Navy receives shipbuilding funds (Francis, 2006). Other demands include increasing national health care costs caused by known demographic trends. Additionally, current military operations in Iraq and Afghanistan add pressure to Department of Defense (DoD) weapons investments by accelerating the need to refurbish or replace existing equipment (Francis, 2006).

The Congressional Research Service doubts whether the Navy's FY 2008 shipbuilding plan is executable. They point to five assumptions the Navy made in order for their plan to be affordable and executable: 1) the Navy's overall budget needs to remain essentially flat in real terms (not decline in inflation-adjusted terms), 2) Navy Operations and Maintenance (O&M) spending needs to remain flat in real terms (not grow), 3) Navy Military Personnel spending needs to remain flat in real terms, 4) Navy Research and Development spending needs to decrease from current levels and remain at this decreased level over the long-run, and 5) ships must be built at the Navy's currently estimated prices (Congressional Research Service, 2007). However, there are many factors that might cause these assumptions to falter, which will make it "difficult or impossible" to execute the Navy's plan (Congressional Research Service, 2007, p. 13). There is a need in the coming years to fund an increased Army and Marine Corps end strength while the overall DoD budget remains flat in real terms. Many observers believe money normally going to the Navy and Air Force will have to be transferred to pay for this increase in personnel. Historically, DoD has also had difficulty meeting O&M goals (Congressional Research Service, 2007). Addressing the third assumption, the Navy does not have total control over Military Personnel costs because Congress can authorize pay and benefit increases. Regarding the fourth assumption, it will be difficult for the Navy to keep R&D costs down over the long-run as it will want to start development on new systems. Finally, addressing the fifth assumption, Navy shipbuilding programs

experienced significant cost growth in the recent past and the CBO believes this cost growth will continue (Congressional Research Service, 2007).

### **C. THE U.S. SHIPBUILDING INDUSTRY**

Often referred to as the “Big Six,” the six largest shipbuilders perform nearly 90 percent of all military work. Classified as tier-1 shipyards, they are structured around two major corporations with Bath Iron Works, Electric Boat, and National Steel and Shipbuilding Company (NASSCO) part of General Dynamics Marine Systems and Avondale, Ingalls Shipbuilding, and Newport News part of Northrop Grumman Ship Systems (Bureau of Export Administration, 2006). Newport News and Electric Boat are the only two shipyards that construct nuclear-powered vessels. Both Bath Iron Works and Ingalls build destroyer-type vessels with Ingalls also building amphibious ships along with Avondale. Finally, NASCO, the only yard on the West Coast and the smallest of the Big Six, specializes in support and smaller auxiliary ships (Shipbuilding Industry Survey, 2004).

The Northrop Grumman Ship Systems includes capabilities to build aircraft carriers, amphibious assault ships, surface combatants, nuclear-powered submarines, Coast Guard and coastal defense craft, and commercial ships. They also have a services division providing after market sales support for a wide range of naval and commercial vessels (Northrop Grumman Corp., 2007). They operate repair facilities in Norfolk, Virginia and San Diego, California. Some of their U.S. Navy ships building projects include the Virginia Class attack submarine, Arleigh Burke (DDG-51) Class AEGIS destroyers, San Antonio (LPD 17) Class amphibious assault ships, and a contract to design the Zumwalt (DDG 1000) Class. Northrop Grumman Ship Systems is the sole provider of Nimitz Class aircraft super-carriers and large-deck, 40,500 ton Wasp (LHD-1) Class amphibious assault ships (Northrop Grumman Corp., 2007).

General Dynamics Marine Systems designs, builds and supports submarines, surface combatants, and auxiliary ships for the U.S. Navy. They are the lead contractor for the DDG 51 Arleigh Burke Class destroyer and the Virginia Class attack submarine. Additionally, they have the second of two contracts to design the Zumwalt (DDG 1000)

Class destroyer, and is one of two industry teams contracted to build the Littoral Combat Ship. Finally, they build the T-AKE Lewis and Clark Class dry-cargo/ammunition combat-logistics ship (General Dynamics Annual Report, 2007).

The American Shipbuilding Association (ASA), an industry trade group, often represents the interests of these firms. ASA member shipyards employ ninety percent of the nation's workers engaged in shipbuilding. Additionally, the ASA represents eighty-eight partner companies that design and manufacture ship systems and components. All Bix Six yards are members of the ASA (American Shipbuilding Association, 2007).

### **III. LITERATURE REVIEW AND THEORETICAL FRAMEWORK**

Stakeholder theory confronts the traditional economic model of the firm, offering an alternative model of firm behavior based upon the relationship of the firm with its external environment (Simmons & Lovegroove, 2005). To take a stakeholder approach involves three related premises: firms/organizations have a multitude of external constituencies that affect or are affected by them; the process and outcome of these interactions impact both stakeholder and the firm; and stakeholder perceptions influence the viability of strategic options (Simmons and Lovegroove, 2005).

Freeman (1984) developed a process firms can use to examine their external environment and ultimately, develop strategies to manage their relationship with their external stakeholders. Jeff Frooman, who uses Freeman's work as the basis for his research into stakeholder influence strategies, believes Freeman's stakeholder analysis process breaks down into three general questions about stakeholders (Frooman, 1999):

- 1) Who are the stakeholders? (This concerns their attributes.)
- 2) What do they want? (This concerns their ends.)
- 3) How are they going to try and get it? (This concerns their means.)

The next sections address Freeman's process to answer these questions by first defining who the stakeholders are, analyzing and explaining their behavior, and how they might obtain their goals.

#### **A. DEFINE WHO THE STAKEHOLDERS ARE**

Mitchell, Agle, and Wood (1997) develop a list of stakeholder attributes, power, legitimacy, and urgency, to determine who stakeholders are. They examine the varying definitions "stakeholder" in stakeholder literature and catalog them into two categories: broad and narrow. Broad definitions enable many external entities to be viewed as a stakeholder while narrow definitions reduce that number. They note that broad definitions tend to focus on a stakeholder's power to influence the organization's

behavior while those who favored a narrow definition focus on the legitimacy of the stakeholder's claim (Mitchell et al., 1997). Legitimacy is defined as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, and beliefs" (Mitchell, et al., 1997, p. 869). Mitchell et al. (1997) state that while not the primary feature of any organizational theory, the attribute of urgency is implicit. Urgency is defined as the "degree to which stakeholder claims call for immediate attention" (p. 867) and exists when only two conditions are met: (1) a claim is time-sensitive and (2) when that claim is critical to the stakeholder.

Frooman (1999) uses resource dependence theory to help define stakeholder power. To frame resource dependence theory, he cites Pfeffer and Salancik's argument that:

Because organizations are not self-contained or self-sufficient, the environment must be relied upon to provide support. For continuing to provide what the organization needs, the external groups or organizations may demand certain actions from the organization in return. It is the fact of the organization's dependence on the environment that makes the external constraint and control of organizational behavior both possible and almost inevitable (Pfeffer and Salancik, 1978: 31).

Resource dependence is said to exist when any one of the following five conditions exist: when one actor is supplying another with a resource that is marked by 1) concentration (few suppliers), 2) controllability, 3) immobility, 4) unsustainability, or 5) essentiality (Frooman, 1999). The criticality of a resource depends on whether an organization can exist without it.

Based on what attributes a stakeholder possesses, Mitchell, et al. (1997) place them into particular categories and subcategories. These specific categories and subcategories characterize the type of salience the stakeholder maintains. Mitchell et al. (1997) define salience as "the degree to which managers give priority to competing stakeholder claims" (p. 869). Table 2 displays these categories and subcategories and their assigned attributes.

		Power	Legitimacy	Urgency
Latent	Dormant	X		
	Discretionary		X	
	Demanding			X
Expectant	Dominant	X	X	
	Dangerous	X		X
	Dependent		X	X
Definitive	Definitive	X	X	X

Table 1. Stakeholder Classifications [After: Mitchell, et al. (1997)]

Stakeholder attributes are variable, socially constructed, and willful exercise of an attribute may or may not exist. These features provide a framework as to how stakeholders gain or lose salience in an organization. Latent stakeholders possess only one of the three attributes and salience is be low. Expectant stakeholders possess two of the three attributes and have moderate salience. Definitive stakeholders possess all three of the attributes and will have high salience (Mitchell et al., 1997).

Dormant stakeholders lack a legitimate relationship and urgent claim, so their power goes unused. Because it is nearly impossible to predict when they may acquire a second attribute, managers should remain cognizant of them because their salience will increase should acquire another attribute (Mitchell et al., 1997). Discretionary stakeholders are likened to corporate philanthropy and absent power and urgent claims, can be disregarded by managers. Demanding stakeholders are annoying, yet not dangerous and warrant nothing more than passing attention by management (Mitchell et al., 1997).

Dominant stakeholders have legitimate claims upon the organization and the power with which to act on these claims. It is expected that these stakeholders will have some formal mechanism in the firm that acknowledges this position (Mitchell, et al., 1997). Stakeholders having urgency and legitimacy are called dependent because they depend on another organization for power to exercise their claim. Managers must be particularly weary of dangerous stakeholders, those having power and urgency (Mitchell

et al., 1997). These stakeholders will be coercive and on rare occasions, potentially violent. Mitchell et al. use the term coercive because “the use of coercive power often accompanies illegitimate status” (p. 877), legitimacy being the missing attribute.

Finally, definitive stakeholders possess all three attributes. When an urgent claim arises with stakeholders in this subcategory, managers should give priority to this stakeholder’s claim (Mitchell et al., 1997).

## **B. STAKEHOLDER BEHAVIOR ANALYSIS**

After a firm identifies its stakeholders and their respective stake on the firm, the next step is to consider these stakeholders’ behavior (Freeman, 1984). There are three categories of behavior for any stakeholder. To analyze the first, the manager lists those behaviors that have actually been observed by a specific stakeholder. This describes the present state of the relationship between the firm and the stakeholder (Freeman, 1984). With respect to cooperative potential, the manager lists tangible, future stakeholder behaviors that would aid the firm in accomplishing its objectives. In other words, what changes in actual behavior can the stakeholder make to be more helpful to the firm (Freeman, 1984)? Finally, analyzing competitive threat requires the manager to list future stakeholder behaviors that would prevent or hinder the firm from achieving its objective. This enables a manager to visualize the adverse risk associated with this stakeholder (Freeman, 1984).

## **C. STAKEHOLDER BEHAVIOR EXPLANATION**

The third step is to construct a logical explanation for the stakeholder’s behavior (Freeman, 1984). Ask the question “why is the stakeholder behaving the way they are?” The manager places himself/herself in the position of the stakeholder and attempts to empathize with that stakeholder’s position. View the issue through the eyes of the stakeholder and try to understand the external environment of that particular stakeholder. Doing so allows the manager to see the external pressures and forces acting on that stakeholder (Freeman, 1984).

One method of understanding the external environment of a stakeholder is by examining the competitive forces and pressures that firm is under in their industry. Michael Porter (1980) proposes five primary forces that aid in understanding these pressures: buyer power, supplier power, rivalry amongst existing firms, threat of substitute products, and the threat of new entry. Figure 1 displays these five competitive forces. The collective strength of these forces determines profit potential, where profit is measured by long-run return on invested capital (Porter, 1980).

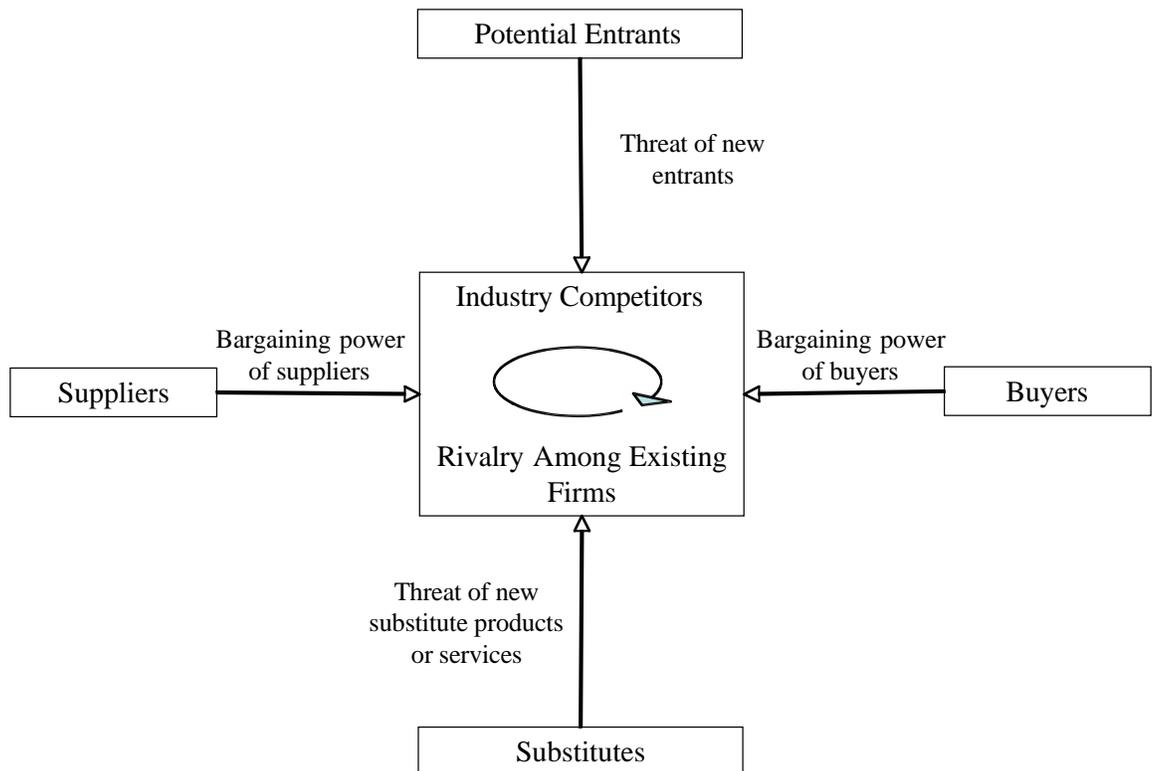


Figure 1. Forces Driving Industry Competition [From: Porter, 1980].

Buyers can force down prices in an industry, demanding higher quality or more services, and playing competitors against each other. Buyers are powerful if the following criteria hold true: they are concentrated or purchase large volumes relative to seller sales, the products buyers purchase represent a significant fraction of their purchases or those products are undifferentiated, and the buyer has full information (Porter, 1980).

Suppliers exert power over industry firms by control over the prices or quality of supplies industry firms require. Suppliers can raise the price of materials or decrease the quality of these materials. Suppliers are powerful under the following conditions (Porter, 1980): they are more concentrated than the industry they sell to (fewer suppliers than buyers), they do not have to worry about other firms providing substitute goods to industry firms, and their products are an important input to the buyer's business.

Intensity of rivalry among existing competitors occurs because one or more of these competitors sees an opportunity or feels the pressure to gain position (Porter, 1980). Substitute products are those that can perform the same function as the product of the industry and limit the potential returns on an industry by placing a ceiling on the prices firms can charge (Porter, 1980). Finally, new entrants into an industry, including those who enter through acquisition of a company already in the industry, introduces new production capacity, a desire to gain market share, and usually substantial resources with which to accomplish these goals (Porter, 1980). Two factors determine whether a firm enters into an industry: barriers to entry and the subsequent reaction from existing firms should the new firm enter the industry. Barriers to entry include the need for economies of scale, capital requirements, any customer switching costs to use the new firm's product, and other cost disadvantages independent of scale (Porter, 1980).

Industry competition continuously works to drive down profits to a floor rate. Porter (1980) states investors will not tolerate returns below this rate because they could have invested their money somewhere else, as he suggests, very stable long-term government securities. These securities are considered the opportunity cost of capital, the other investment opportunities forfeited by the investor (Mankiw, 2004).

By completing these steps, the manager attains answers to basic questions about the stakeholder (Freeman, 1984):

Over the long run, what is the stakeholder trying to accomplish?

On the issue in question, what is the stakeholder trying to accomplish?

What is the link between their long-run objective and current issue?

By answering these questions, the manager ultimately answers the question this step originally asked, “why is the stakeholder behaving the way they are?”

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## **IV. WHO ARE THE STAKEHOLDERS**

The first step in conducting a stakeholder analysis is defining who the stakeholders of a firm are (Freeman, 1984). In this case, this means asking who are the stakeholders of the Navy's Thirty-Year Shipbuilding Plan? This thesis uses Frooman's (1999) stakeholder work expounding resource dependence theory and Mitchell, Angle, and Wood's (1997) salience approach to answer this question. Money is the resource the Navy has that shipbuilders are seeking. However, because the Navy obtains this money for shipbuilding through the federal budgeting process instead of selling a good or service as a private firm does, it is important to understand this budgeting process.

### **A. THE DEFENSE ACQUISITION PROCESS**

Each year, Congress requires the Navy to submit a long-range shipbuilding plan. It is from this plan that the Navy develops the funding levels it desires for the Shipbuilding and Conversion, Navy (SCN) account. This budget is rolled up into the larger Department of Defense (DoD) budget and submitted annually as the President's budget proposal to the Congress. At this point, Congress assumes control and begins proceedings to determine what programs will be authorized and how much money will be appropriated for those authorizations. There are three phases to this process: the budget resolution, passage of the defense authorization act, and finally, passage of the defense appropriations act (McCaffery and Jones, 2004).

The budget plan proposed by the Congress is called the Budget Resolution. This resolution represents a commitment by the Congress to itself outlining how much it will tax and spend in the upcoming appropriation process; it is only a guide (McCaffery and Jones, 2004). The next phase is the passage of the defense authorization act, which becomes law after the president signs it. The Congressional authorizing committees for DoD are both the House and Senate Armed Services Committees. This act approves defense programs, with a particular focus on newly proposed programs. This act can also provides spending and policy guidelines for the DoD. It is important to note that the

DoD cannot spend money on existing or new programs, even if Congress provides money for them in appropriations, until they are authorized (McCaffery and Jones, 2004).

The third phase results in the defense appropriations act, primarily prepared by the House and Senate Appropriations Committees and the respective subcommittees for national defense (McCaffery and Jones, 2004). This act provides sums of money to DoD accounts with precise language found in the committee reports accompanying this act. These reports show the amount of money appropriated to each account line-by-line and if no specific language changes the DoD request, the Congress considers the justifications the DoD presented as binding, expecting DoD to execute those programs in accordance with their justification documents (McCaffery and Jones, 2004). Committee reports do not have the force of law, as does the defense appropriations act, but when the DoD fails to follow the guidance the reports set forth, someone from DoD will have to testify as to why. Failing to heed these reports could mean tighter restrictions on the DoD, requests for documents, and additional reporting requirements (McCaffery and Jones, 2004).

Congress arrives at these programmatic and appropriations decisions by holding hearings, listening to testimony from the DoD as well as other parties with an interest in what defense programs the act authorizes. Other parties can include independent think tanks like the Rand Corporation, lobby groups, trade associations, or even Congressional agencies like the Governmental Accountability Office (GAO), the Congressional Research Service (CRS), and the Congressional Budget Office (CBO). Additionally, when the versions of the various House and Senate bills do not match, specific members in leadership positions meet in a conference committee, which allows the two chambers to work out a compromise solution that can be passed by the entire House and Senate. These conference committees are usually the focus of intense lobbying efforts (McCaffery and Jones, 2004).

## **B. DEFINING THE STAKEHOLDERS**

Shipbuilding firms constructing surface combatants rely almost solely on the Navy for their income, making them highly dependent on the Navy. The Navy depends on the two primary shipbuilders for construction of naval vessels. These ships cost a

great deal of money to build and are purchased from money appropriated by Congress to the Navy's SCN account. Because legitimacy is defined as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, and beliefs" (Mitchell, et al., 1997, p. 869), shipbuilders have a legitimate claim on the Navy's Thirty-Year Shipbuilding Plan.

One of the primary goals of a business operating in the free market system is to make a profit. Each quarter, General Dynamics and Northrop Grumman, the parent companies of the primary shipbuilding firms, release quarterly earnings reports. They also release annual reports at the end of their company's fiscal year. The shipbuilding business units of both parent companies play an important role in those company-wide statements. In turn, the public – and potential investors - place great importance on those reports. Those reports effect the public's perception of the company's future profitability and as such, stock prices of the company rise and fall based on those perceptions. Unprofitable quarters and years drive the stock price of the company down. Likewise, profitable quarters and years increase the stock price. News also impacts stock prices. For example, if the Navy announces the awarding of a ship construction contract, the public perception of that company's profitability outlook increases. Conversely, the canceling of a contract would have the opposite effect, negatively impacting the public's perception of profitability. Therefore, shipbuilding firms possess a second attribute, urgency. Recall that Mitchell, et al. (1997) define urgency as "the degree to which stakeholder claims call for immediate attention," and is synonymous with words like "compelling, driving, and imperative" (p. 867). Urgency is said to exist when two conditions are met: 1) when the claim or relationship is important to the stakeholder and 2) that claim is of a time-sensitive nature where time sensitivity is defined as "the degree to which managerial delay in attending to the claim or relationship is unacceptable to the stakeholder" (p. 867). Both conditions are met in that as the sole customer for both shipbuilding firms, Navy shipbuilding decisions are not just important, but critical to those firms because those decisions directly impact the firms' profitability.

Using the system set forth by Mitchell, Angle, and Wood (1997), shipbuilders are categorized as expectant stakeholders because they possess legitimacy and urgency and

are of the dependent stakeholder class because they lack power to carry out their desires and therefore, depend on others to help them achieve their goals (Mitchell, et al., 1997). The Navy can anticipate them to take an active versus passive stance. Shipbuilders have experienced some success in furthering their desires through working with others. Successful lobby efforts by the American Shipbuilding Association (ASA), a trade organization comprised predominantly by the two shipbuilding firms, resulted in the Congress passing multiple pieces of legislation proposed by the ASA.

The Congress is another important stakeholder. They pass the defense authorization act, deciding what programs the DoD undertakes, and the appropriations act, using their constitutional power of the purse to provide funding for those various programs (McCaffery and Jones, 2004). Because they control the resource on which the shipbuilding firms and Navy are dependent, Congress possesses the attribute of power. On a larger scale, Congress also has a significant interest in the national security of the United States of which the health of the Fleet is an important piece. Additionally, specific congressmen and women and senators represent constituencies that have a significant interest in the Navy's shipbuilding plan. Shipbuilding firms are large employers in the states and districts where they are located. Their success or failure can mean jobs lost or gained and ultimately, votes for or against incumbent representatives and senators. As such, Congress possesses a legitimate claim on the Navy's Thirty-Year Shipbuilding Plan.

Because they possess power and legitimacy, Congress is categorized as an expectant stakeholder and placed in the dominant stakeholder class (Mitchell, et al., 1997). Their influence on the Navy's shipbuilding plan is assured.

There are other stakeholders to the Navy's shipbuilding plan, but these firms' role are relatively minor because they are smaller, usually technology-based firms that typically provide components that are installed on warships, combat systems and engineering plant components, for example. These firms have a legitimate claim on the shipbuilding plan, but lack both power and urgency. Therefore, they are in the latent stakeholder class and are considered discretionary stakeholders (Mitchell, et al., 1997). Without an urgent claim and the power to impose their will, there is no pressure for the

Navy to be overly concerned with this stakeholder group. Of note, many of these firms are members of the ASA and can have their desires expressed through that trade organization if they so desire (American Shipbuilders Association Partners, n.d.). For the purposes of this thesis, latent stakeholders are not considered for deeper investigation.

Utilizing resource dependence theory, this chapter determines the key stakeholders to the Navy's Thirty-Year Shipbuilding Plan. The resource in question is federal appropriations to the Shipbuilding Conversion Navy account. The Navy submits its shipbuilding plan each year to Congress. Additionally, they request funding for shipbuilding through the Department of Defense based on this plan. Based on the Navy's request and input from others, Congress authorizes and appropriates money to the Navy for the building of ships. The Navy, in turn, authorizes construction contracts and purchases these ships from shipbuilders based on the shipbuilding plan. The primary recipients of shipbuilding money are General Dynamics Marine Systems and Northrop Grumman Ships Systems. Using Mitchel, Agle, and Wood's (1997) stakeholder salience research, this chapter classifies shipbuilders as expectant stakeholders because they possess legitimacy and urgency. The Navy can anticipate expectant stakeholders to take an active versus passive position towards the shipbuilding plan. Specifically, shipbuilders are of the dependent stakeholder class because they lack power to carry out their desires and therefore, depend on others to help them achieve their goals with regard to the Navy's shipbuilding plan. Congress is categorized as an expectant stakeholder and are of the dominant stakeholder class because they possess power and legitimacy. Their influence on the Navy's shipbuilding plan is assured.

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## **V. STAKEHOLDER BEHAVIOR ANALYSIS**

The second step in conducting a stakeholder analysis is to analyze stakeholder behavior, accomplished in three parts. The first is to examine their actual or observed behavior. During their budgetary decision making process for Fiscal Year 2008, a Congressional subcommittee called shipbuilding firms, the American Shipbuilders Association, and Navy leadership responsible for the Thirty-Year Shipbuilding Plan to testify. This testimony provides a wealth of insight as to shipbuilder's problems and recommendations. The second part of analyzing a stakeholder's behavior is to define their cooperative potential (Freeman, 1984), that is, to ask what the stakeholders could do to aid the Navy in accomplishing the goals set forth in the shipbuilding plan. The final part is to define the shipbuilding firms' competitive threat by listing behaviors that would prevent the Navy from accomplishing the goals of the shipbuilding plan (Freeman, 1984).

### **A. OBSERVED BEHAVIOR**

The president of the ASA, Ms. Cynthia Brown in her March 20, 2007 testimony to the House Armed Services Committee, Subcommittee on Seapower and Expeditionary Forces, points to three main issues impacting the shipbuilding industry, which Congress can correct. The ASA desires to increase and stabilize ship production, stop the practice of contract retentions and withholdings, and to have U.S. acquisition laws enforced. Also testifying during the same hearing, Mr. Philip A. Teel, President of Northrop Grumman Ship Systems, compares best-in-class shipbuilding techniques and business models with those of the U.S. industry, pointing out their vast differences. By adopting many best-in-class practices and changing U.S. Navy shipbuilding program models, he believes the U.S. shipbuilding industry will increase efficiency and provide the Navy with the ships it needs at lower cost. Finally, corroborating this testimony are two Congressional investigatory agencies, the GAO and CRS. Paul L. Francis, Director of the GAO's Acquisition and Sourcing Management Team, advocates the Navy implementing better

business cases for the construction of naval vessels. The CRS finds that current and predicted future production levels for the various shipyards are below the levels of just a decade and a half ago.

**1. Ms. Cynthia Brown, President, American Shipbuilding Association**

Low and unstable rates of naval ship production negatively impact the shipbuilding industrial base. Because of changing production schedules and profiles, shipyards have great difficulty managing workloads necessary to retain highly trained production and engineering workers (Brown, 2007). Shipyards cannot make the necessary capital investments in their shipyards to improve production processes and facilities nor can they manage day-to-day operations to maximize efficiency in design and construction of warships (Brown, 2007). Capital investments are a key to increasing efficiency and decreasing costs. These capital investments depend on cash flow, work projections, and profits. Given competing corporate needs and interests, low and unstable rates of production preclude shipbuilders from presenting such a business case to corporate parents and therefore, do not receive money for capital investment. Facilities that demonstrate large profits and return on invested capital receive corporate dollars (Statement of Ms. Cynthia L. Brown, 2007).

Many investments could be made that would show a favorable return on investment to the Federal Government. One such investment is by expanding the use of special incentive fees for all Navy shipbuilding contracts; fees specifically designated for shipyards to invest in process and facility improvements in business cases where the return on investment is favorable to the Navy (Brown, 2007). The contractor must present a business case that: “1) savings through changes in design, material used, technology, or production process would result in savings to the ship program, or 2) a proposed investment would itself result in savings for a shipbuilding program” (Brown, 2007, p. 3). The ASA provides language for inclusion into the FY 2008 Defense Authorization Act that authorizes \$100 million to begin shipbuilding contract incentive fees. Under the ASA’s proposal, the Navy would be required to report to Congress on how they have distributed or plan to distribute that money for specific capital

expenditures by shipbuilding program and it instructs the Navy to annually budget money for incentive fees for shipbuilding capital investment beginning in FY 2009 (Brown, 2007). Ms. Brown (2007) claims this proposal would reduce Navy costs by accomplishing four things: 1) emphasizing designs that result in ships easier to produce; 2) controlling non-value added requirement changes, which are not operational necessities and add costs; 3) reducing ship program costs resulting from targeted investments, and; 4) improving shipyard competitiveness, which could ultimately increase the number of ships ordered in U.S. shipyards. The hope is that if the Navy, the primary buyer of ships from these yards, is able to reduce costs, those cost savings then translate into the Navy buying more ships.

As of her testimony, the Navy had not paid \$345 million to shipyards as agreed to in their overhaul and shipbuilding contracts. This adversely affects cash flow, which is vital to day-to-day shipyard operations, and in turn, inhibits shipyards from paying subcontractors in a timely fashion (Brown, 2007). Additionally, withholding money owed to shipyards negatively impacts their ability to operate more efficiently because money they could otherwise spend on process improvement and efficiency gains is tied up in paying for other operations. The ASA provided language for Congress to pass that requires the Navy to abide by the terms of contract payment clauses negotiated with each shipyard. Passage of this legislation would ease cash flow constraints, allowing shipyards to operate more efficiently in ship production (Brown, 2007). Shipyards are hesitant to take the matter to court because that could halt work on ships and damage the working relationship with “their predominant, if not only, customer” (Brown, 2007, p. 5).

If a dedicated, long-term military ship requirement exists, then in accordance with U.S. acquisition laws, it must be filled by ships built in the U.S. There are presently 6 foreign-built ships under lease for terms of 59 months by the Navy that provides military sealift capability. Five of these six ships had their lease renewed for another 59 months, totaling nearly 10 years of service in the Navy (Statement of Ms. Cynthia L. Brown, 2007). This constitutes a long-term requirement and because the Budget Enforcement Act of 1990 defines a vessel lease of five or more years as a purchase, 10 U.S. 7309 applies. This law requires that a vessel purchased for all branches of the armed services

be built in the United States (Statement of Ms. Cynthia L. Brown, 2007). When the Navy circumvents these laws, they hinder the shipbuilding industry from increasing ship production. Because volume cannot be increased, shipbuilders cannot reduce ship prices or construction costs and the Navy will pay higher prices for other ships (Statement of Ms. Cynthia L. Brown, 2007). Ms. Brown (2007) urges Congress to include the Taylor/Davis legislation in the FY 2008 Defense Authorization Act, stopping the Navy from circumventing acquisition law.

**2. Mr. Philip A. Teel, President, Northrop Grumman Ship Systems, Inc.**

Best-in-class shipyards are characterized by an intense focus on design for production. Design for production includes elements like the use of proven systems and subsystems, standard parts and components, standard designs, limited customization, large production runs, and minimal changes from vessel to vessel (Teel, 2007). U.S. naval shipyards, however, are characterized by advanced technology systems, many changes from vessel to vessel, small production runs, and complex, continuously evolving designs. This approach to shipbuilding calls for a custom, flexible production process, requiring a job-shop business model (Teel, 2007). Under current Navy business cases, a job-shop business model is the only way to meet Navy requirements that vary from program to program, by ship type, and sometimes, even hulls within the same program (Teel, 2007). Best in class shipyards average 240 changes in the designs of the first ship in a new class, contrasting, for example, the Navy's LHD program, which experienced 5,750 changes from LHD-1 to LHD-2 and a subsequent average of 3,550 changes for each follow-on ship (Teel, 2007). Reducing change orders in ship construction is another area to learn from best-in-class yards. Of the total DDG-51 class ships built by Northrop Grumman Ship Systems, change order activity added an additional 6 million labor hours to construction, costing \$160 million (Teel, 2007). Understanding the need to provide the latest technology to warships, Teel advocates strong systems engineering skills and shipbuilding teams to balance reducing change orders while installing the latest technology (Teel, 2007).

Combat systems comprise approximately 55 percent of total ship costs. Because these systems introduce additional complexity into the production process, they also impact shipbuilder costs (Teel, 2007). Subsequent GAO testimony supports Teel, addressing the negative impact of immature technologies and design instability in Navy shipbuilding business cases.

### **3. Corroboration from Congressional Agencies**

Paul L. Francis, Director of the GAO's Acquisition and Sourcing Management Team, states that Navy shipbuilding programs are built around "unexecutable business cases" because they require immature technologies, have no design stability until late in production, and contain cost and schedule estimates that are "unrealistically low" (Francis, 2007, p. 8). A solid business case requires that key technologies be demonstrated before ship development begins and that designs be stabilized before construction begins (Francis, 2007). Once construction starts, the consequences of not using a realistic business case become apparent. Francis (2007) provides an example: the most cost efficient sequence of ship construction starts from the bottom up. Once sections of the ship are installed, access to lower decks becomes extremely difficult. If equipment from immature technologies that are to be located on these decks is not ready for installation when these lower decks are constructed, the shipyard workers have to install them later after other decks and equipment have been installed. Workers need more time for installation of the once missing equipment in these now less accessible desk, which causes increased labor hours and costs.

In addition to reducing both change between ships and the use of immature technologies, there are two more techniques that American shipyards can implement from best-in-class shipyards: fewer gaps between ships, i.e. reducing order intervals, and producing more hulls for each ship class, i.e. increasing run lengths (Teel, 2007). By way of example, the order rate for DDG 51 class ships varied from a high of five ships per year to a low of two. Lengthy production breaks cause learning curve efficiencies to be wiped out, increasing labor costs (Teel, 2007). Analysis from the Congressional Research Service (CRS) examines the issue of gaps in the Navy's shipbuilding plan.

Answering a Congressional question as to whether the Navy's shipbuilding plans adequately support the shipbuilding industrial base, the CRS finds that procurement from FY2009-2016 increases to between 10 and 14 ships per year, decrease to between 4 and 6 during the FY2017-FY2020 period, and increase once again to 10 or 11 ships per year after 2022 (Congressional Research Service, 2006). The CRS reports that this pattern could place the industry on a production "roller coaster" (p.17) that could decrease shipbuilding efficiencies and increase costs.

Posed this question again in 2007, the Congressional Research Service found that the Navy anticipates building an average of 1.5 DDG-1000s and CG(X)s per year over the next 17 years. Because these ships are slightly larger in light-ship displacement than DDG-51 class ships, current designs for DDG-1000 and CG(X) indicate that constructing 1.5 ships per year would be the approximate equivalent of 2.7 DDGs per year. If this construction were to be split evenly between the two shipyards that build surface combatants, Ingalls and Bath Iron Works, as it was in building the DDG-51 class, then each yard would receive the equivalent of 1.3 DDG-51 ships per year (Congressional Research Service, 2007). During the 1990s, shipyards argued a total of 3 DDGs per year would be required to maintain financial health. An equivalent of 2.7 DDGs represents about 90 percent of this rate (Congressional Research Service, 2007). Moreover, if the Navy sought a competition between the two yards, the losing yard would suffer significant workload reductions, revenues, and employment (Congressional Research Service, 2007).

The testimony from the ASA and shipbuilders, supported by GAO and CRS analysis, is very helpful in understanding the present state of the relationship between industry and the Navy shipbuilding plan. The ASA complains of low and unstable production in the U.S. shipbuilding industry caused by the Navy, proposes legislation that would stop the Navy's withholding and retaining money from shipbuilding contracts, and asks Congress to enforce U.S. acquisition laws, preventing the Navy from long-term leasing of foreign-built ships that equate to purchases. Finally, Teel recommends the adoption of specific best-in-class shipbuilding practices, recommending longer

production runs with fewer gaps between ships and stabilized designs marked by using mature technologies and reduced changes from ship to ship.

## **B. COOPERATIVE POTENTIAL**

Freeman (1984) asks managers to next define a stakeholder's cooperative potential. What behaviors by shipbuilders could be observed in the future that would aid the Navy in accomplishing its shipbuilding plan? One such behavior would be to fully support the Navy's plan during Congressional hearings and stop proposing legislation hindering Navy practices. Another beneficial behavior would be if shipbuilders lobby Congress to appropriate the funds requested by the Navy. Finally, shipbuilders making greater capital investments that improve production processes, increase construction efficiencies, and reduce costs to the Navy would be beneficial.

## **C. COMPETITIVE THREAT**

The final piece in the analysis of a stakeholder's behavior is to determine what behaviors shipbuilders could exhibit in the future that could prevent the Navy from accomplishing its shipbuilding plan (Freeman, 1984). One such preventative behavior would be for shipbuilding firms to not make any or at least fewer capital investments in their shipyards. Another might be to increase lobbying efforts to Congress, proposing more legislation beneficial to shipbuilders. Shipbuilders could reverse their present desire to avoid a court battle (Brown, 2007) and take the Navy to court, suing them for the retention and withholding of money owed to shipbuilders. However, each of these actions carry risks that shipbuilding firms might not be willing to make out of fear of damaging their relationship with their primary customer. Shipbuilders already show reluctance to take the Navy to court over contract retentions and withholdings (Brown, 2007). Additionally, these more aggressive are not typical for a dependent stakeholder (Mitchell, et al., 1997).

This chapter analyzes the behavior of shipbuilders by examining their actual behavior through testimony given before Congressional hearings. By reviewing Congressional testimony from the President of the American Shipbuilders Association,

Ms. Cynthia Brown, and the President of Northrop Grumman's Ship Systems, Mr. Philip Teel, their concerns about the shipbuilding plan become apparent. They want to increase their profits and shareholder value, a basic motivation of any business. Hampering their efforts are low and unstable rates of shipbuilding, production gaps, and instability in ship design/reduction of change orders. The Government Accountability Office largely reached the same conclusions, corroborating their testimony. This chapter then analyzes shipbuilder's cooperative potential by listing future behaviors that would aid the Navy in accomplishing their shipbuilding goals. Finally, it analyzes the shipbuilder's competitive threat by listing future behaviors that would hinder the accomplishment of the Navy's goals. The next chapter of this thesis conducts Freeman's (1984) third step in stakeholder analysis: explaining their behavior.

## **VI. STAKEHOLDER BEHAVIOR EXPLANATION**

Why are the stakeholders behaving the way they are? To help answer this question, managers must place themselves in the position of the stakeholder and view matters through their eyes. This chapter uses Porter's (1980) framework to analyze the five competitive forces experienced by Northrop Grumman and General Dynamics. This chapter extrapolates data from both General Dynamics and Northrop Grumman's most recent annual reports filed with the Securities and Exchange Commission. This selected financial data provides a measure to evaluate how these firms are performing and helps understand these firm's current positions. Finally, the labor market in the U.S. shipbuilding industry is an important pressures to help understand why these companies are behaving the way they are.

### **A. FIVE FORCES ANALYSIS OF THE U.S. SHIPBUILDING INDUSTRY**

#### **1. Intensity of Rivalry**

Intensity of rivalry among existing competitors occurs because one or more of these competitors sees an opportunity or feels the pressure to gain position (Porter, 1980). Both General Dynamics Marine Systems and Northrop Grumman Ship Systems recognize one another as competitors, but as the following statement from General Dynamics indicates, they are also collaborators, "The Marine Systems group has only one primary competitor, Northrop Grumman Corporation, with which it also partners or subcontracts on several programs, including the Virginia Class submarine and the DDG-1000 Zumwalt Class destroyer" (General Dynamics, 2005). As is demonstrated by the sharing of naval shipbuilding contracts between the two companies and their various shipyards, the U.S. Government keeps these yards functioning, believing it is in their long-run interest to maintain them. However, there are cost implications in so doing because contracts are not awarded based on the best value to the government (Shipbuilding, 2005). These implications include lost production efficiencies gained from longer production runs and increased volume.

Additionally, U.S. Law prohibits the Navy from purchasing ships, especially warships, from other countries. The elimination of these foreign yards from the U.S. marketplace serves as a further benefit to Northrop Grumman Ship Systems and General Dynamics Marine Systems. Understandably, there are national security issues in using foreign yards, but it is important to understand the trade-offs by removing them from competition.

Porter (1980) predicts that as an industry matures, growth rates decline and rivalry intensifies, causing profits to decline and, sometimes, a shakeout to occur in the industry. This might explain the shipbuilding industries environment prior to the 1990s, but after industry consolidation into two primary firms, government practices give each firm contracts in order to keep them operating and eliminate foreign competition, benefiting U.S. firms by preventing deteriorating profits caused by true and intense competition.

## **2. Buyers**

Buyers are powerful if the following criteria hold true: they are concentrated or purchase large volumes relative to seller sales totals, the products buyers purchase represent a significant fraction of their purchases or those products are undifferentiated, and the buyer has full information (Porter, 1980). Figure 2 shows the buyers of Northrop Grumman's Ships segment and compares the revenues each generates. Revenue from the U.S. Government includes contracts in which Northrop Grumman is either the prime contractor or sub-contractor with the final product sold to the U.S. Government. Clearly, the U.S. Government is the primary, if not sole, source of revenue for the Ship Systems segment of Northrop Grumman. The 2006 Annual Report notes "The company conducts most of its business with the U.S. Government, principally the Department of Defense..." (Northrop Grumman, 2007, p.1). While both primary shipbuilding companies do maintain yards, one each, with a commercial interest, that interest is very small (Shipbuilding, 2005).

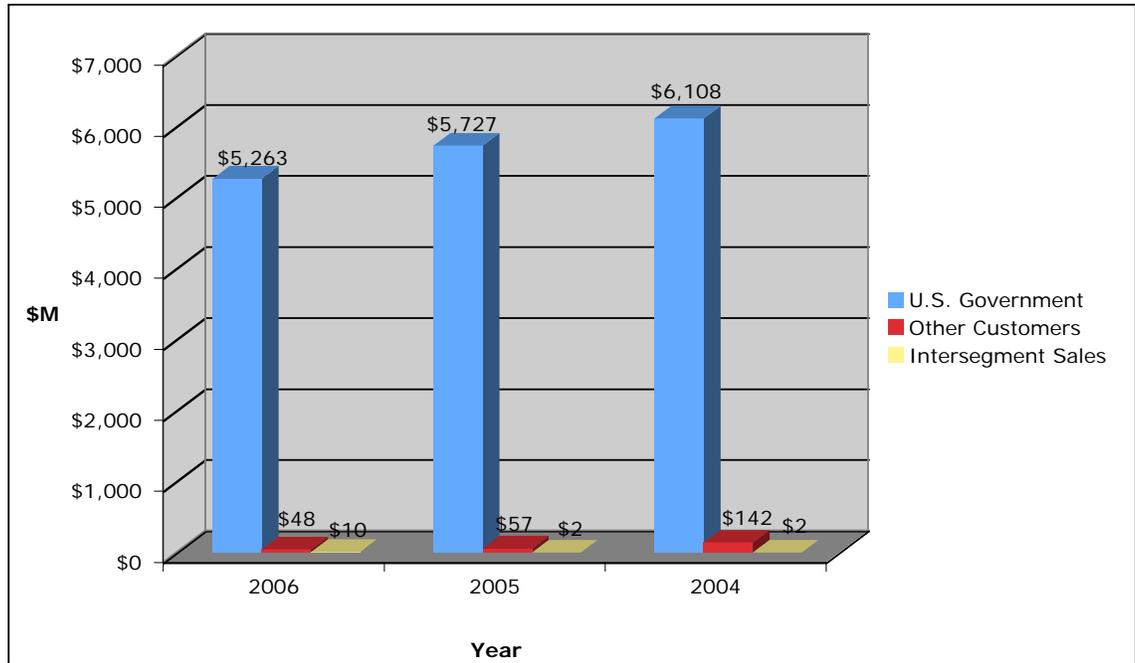


Figure 2. Northrop Grumman Ship Segment's Revenue by Customer Group [From: Northrop Grumman Annual Report, 2007]

While General Dynamics Marine Systems did not provide specific segment revenue data by customer, they do write in their 2006 Annual Report that “General Dynamics primary customer is the U.S. Government, particularly the Department of Defense” (General Dynamics, 2007, p.10).

Even though these firms have one primary buyer, which normally gives the buyer that ability to force down prices at the expense of the firm's profitability, this is offset in the shipbuilding industry by the U.S. Government's desire to award shipbuilding contracts to both companies, thereby keeping each afloat. Additionally, these are the two primary firms from which the U.S. Navy is able to purchase ships. In other words, there is no other supplier of ships. These two factors combine to offset any advantage the Navy gains from being the primary buyer.

### 3. Suppliers

Suppliers exert power over industry firms by controlling the prices or quality of supplies industry firms require. Suppliers can raise the price of materials or decrease the

quality of these materials. Suppliers are powerful under the following conditions: they are more concentrated than the industry they sell to (fewer suppliers than buyers), they do not have to worry about other firms providing substitute goods to industry firms, and their products are an important input to the buyer's business (Porter, 1980). There is a limited supplier base for the unique and highly specialized materials required to build ships. U.S. laws requiring the use of only domestically acquired material further narrow the supplier base. These factors make raw materials susceptible to price increases by the supplier (Government Accountability Office, 2005). Additionally, the Navy's low rate of ship production caused numerous suppliers to close or merge, further reducing supplier competition in the marketplace (Government Accountability Office, 2005).

Marked by high concentration, a lack of substitute supplies, and their product's importance to shipyards, shipbuilders are vulnerable to suppliers who enjoy a moderate amount of power in this industry. Powerful suppliers can squeeze profits out of an industry and are subsequently a detriment to the shipbuilding firms (Porter, 1980).

#### **4. Threat of New Entrants**

New entrants into an industry, including those who enter through acquisition of a company already in the industry, introduces new production capacity, a desire to gain market share, and usually substantial resources with which to accomplish these goals (Porter, 1980). Two factors determine whether a firm enters into an industry: barriers to entry and the subsequent reaction from existing firms should the new firm attempt to enter the industry. Barriers to entry include economies of scale, capital requirements, customer's switching costs to use the new firm's product, and other cost disadvantages independent of scale (Porter, 1980).

Economies of scale means a decline in the unit cost of a product as the volume in a given period increases and that the presence of economies of scale always lead to a cost advantage for the large-scale over the small-scale firm (Porter, 1980). Brown, Teel and Francis's (2007) Congressional testimony confirms there are economies of scale in this industry. Shipbuilders are actively seeking to increase their volume of ship orders so that they may realize the benefits of greater economies of scale. Large sums of money are

required for capital investment, especially for a potential entrant starting from scratch. In fact, in the past decade, Northrop Grumman and General Dynamics acquired many smaller-scale shipyards, consolidating the industry (Northrop Grumman Annual Report, 2007; General Dynamics Annual Report, 2007). As mentioned previously, U.S. law also prevents foreign yards from entering the U.S. market. The presence of these barriers to entry makes it unlikely a new firm will enter the shipbuilding industry to compete for U.S. Navy construction contracts, benefiting established shipbuilders.

## **5. Threat of Substitutes**

Substitute products are those that can perform the same function as the product of the industry and limit the potential returns on an industry by placing a ceiling on the prices firms can charge (Porter, 1980). To analyze the threat of substitutes, this question must be answered: are there any products that can perform the same function as the product of the shipbuilding industry? (Porter, 1980). The function of warships is to protect the United States physically as well as protect U.S. interests abroad through command of the seas. While there are many machines, systems, and other devices that provide for the national security interests of the United States, none can do so by providing command of the sea. As such, there are no substitute products for warships, bolstering shipbuilding companies.

## **B. FINANCIAL POSITIONS**

### **1. Northrop Grumman**

The Northrop Grumman Ships segment includes capabilities to build aircraft carriers, amphibious assault ships, surface combatants, nuclear-powered submarines, Coast Guard and coastal defense craft, and commercial ships. The Ship Systems segment also has a services division providing after market sales support for a wide range of naval and commercial vessels (Northrop Grumman Corp., 2007). They operate repair facilities in Norfolk, Virginia and San Diego, California. Some of their U.S. Navy ship building projects include the Virginia Class attack submarine, Arleigh Burke (DDG-51) Class

AEGIS destroyers, the Zumwalt (DDG 1000) Class destroyer, and San Antonio (LPD 17) Class amphibious assault ships. They are the sole provider of Nimitz Class aircraft super-carriers and large-deck, 40,500 ton Wasp (LHD-1) Class amphibious assault ships (Northrop Grumman Corp., 2007).

Figure 3, Northrop Grumman Net Sales by Primary Business, demonstrates that Ship Systems is consistently the smallest generator of sales amongst the four primary businesses, generating over \$5 billion less than the information services business, the leading segment in sales, last year.

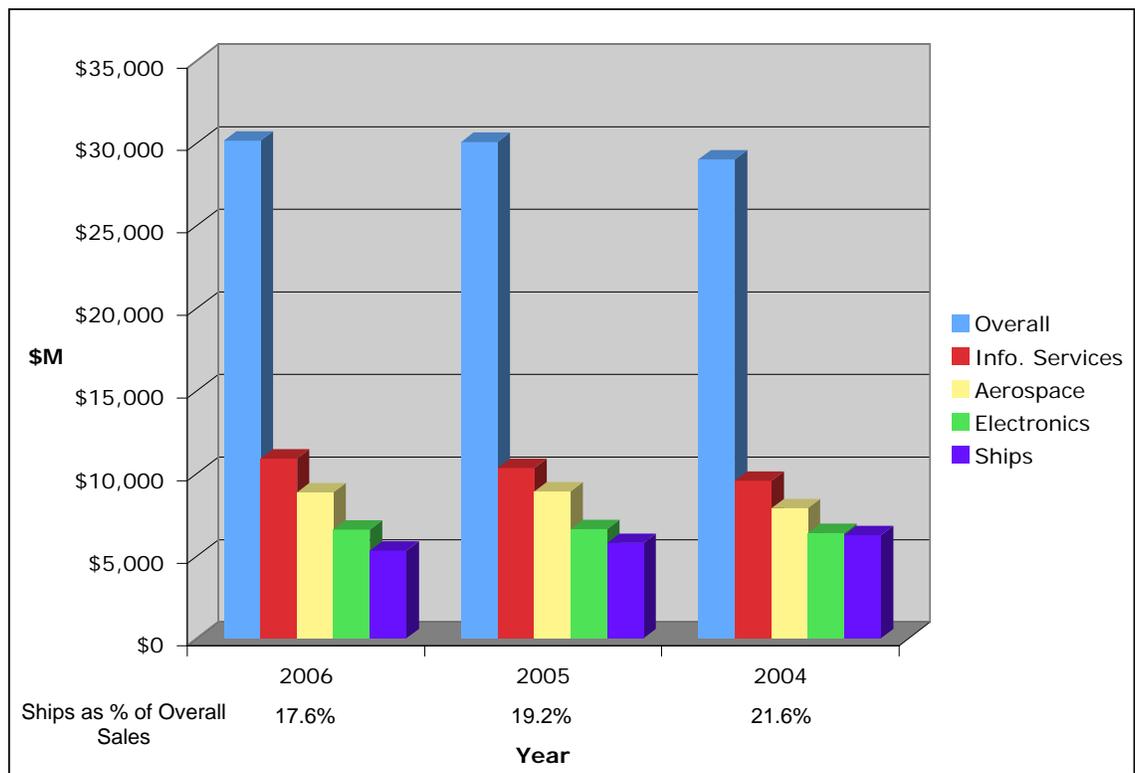


Figure 3. Northrop Grumman's Net Sales by Primary Business [From: Northrop Grumman Annual Report, 2007]

Figure 4, Northrop Grumman Profit Margins by Primary Business, shows that the Ships segment generates fewer profits than the three other primary businesses, generating only \$393 million in profit last year against the \$744 million generated by the electronics business, the next lowest of the primary businesses.

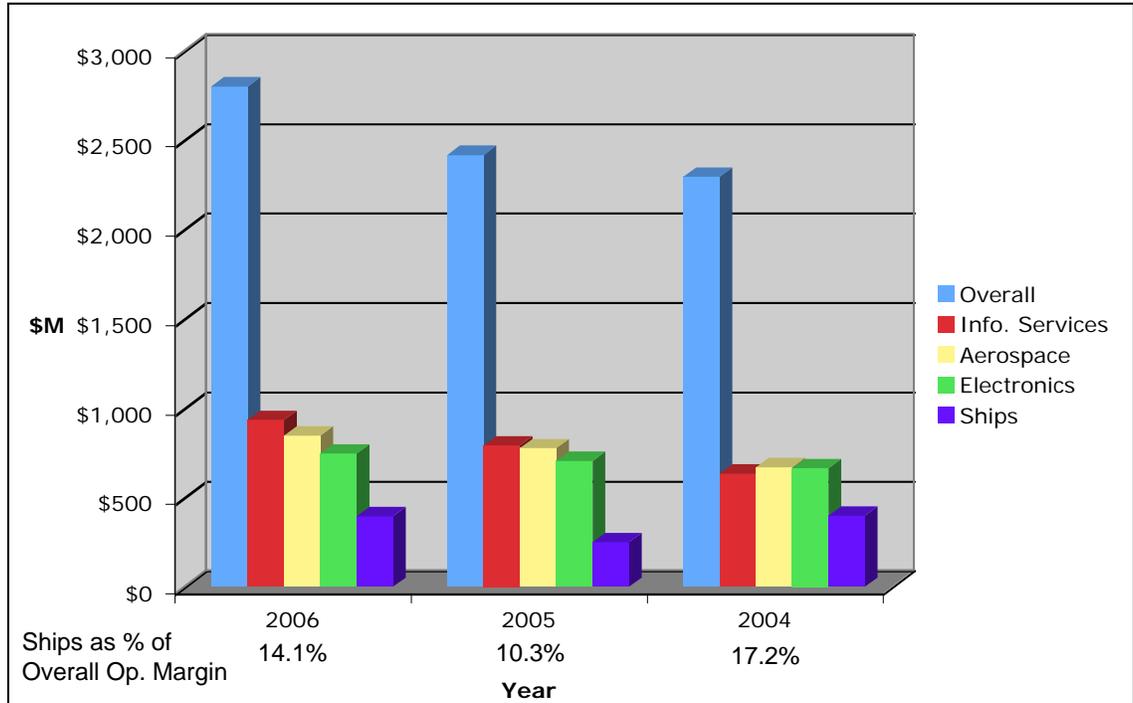


Figure 4. Northrop Grumman Profit Margins by Primary Business [From Northrop Grumman Annual Report, 2007]

## 2. General Dynamics

General Dynamics Marine Systems designs, builds and supports submarines, surface combatants, and auxiliary ships for the U.S. Navy. They are the lead contractor for the DDG 51 Arleigh Burke Class destroyer and the Virginia Class attack submarine. Additionally, they have the second of two contracts to design the Zumwalt (DDG 1000) Class destroyer, and are one of two industry teams contracted to build the Littoral Combat Ship. Finally, they build the T-AKE Lewis and Clark Class dry-cargo/ammunition combat-logistics ship (General Dynamics Annual Report, 2007).

They acknowledge that while DoD's budget has grown rapidly in the past few years, there is no guarantee that it will continue and as such, any decrease in U.S. defense spending or allocation changes could result on one of the company's programs being

reduced or canceled. If either of these were to occur, the company’s ability to sustain itself and grow future sales and earnings would be adversely affected (General Dynamics, 2007).

Figure 5 illustrates the net sales of each business segment. Marine Systems consistently ranked third out of the four segments.

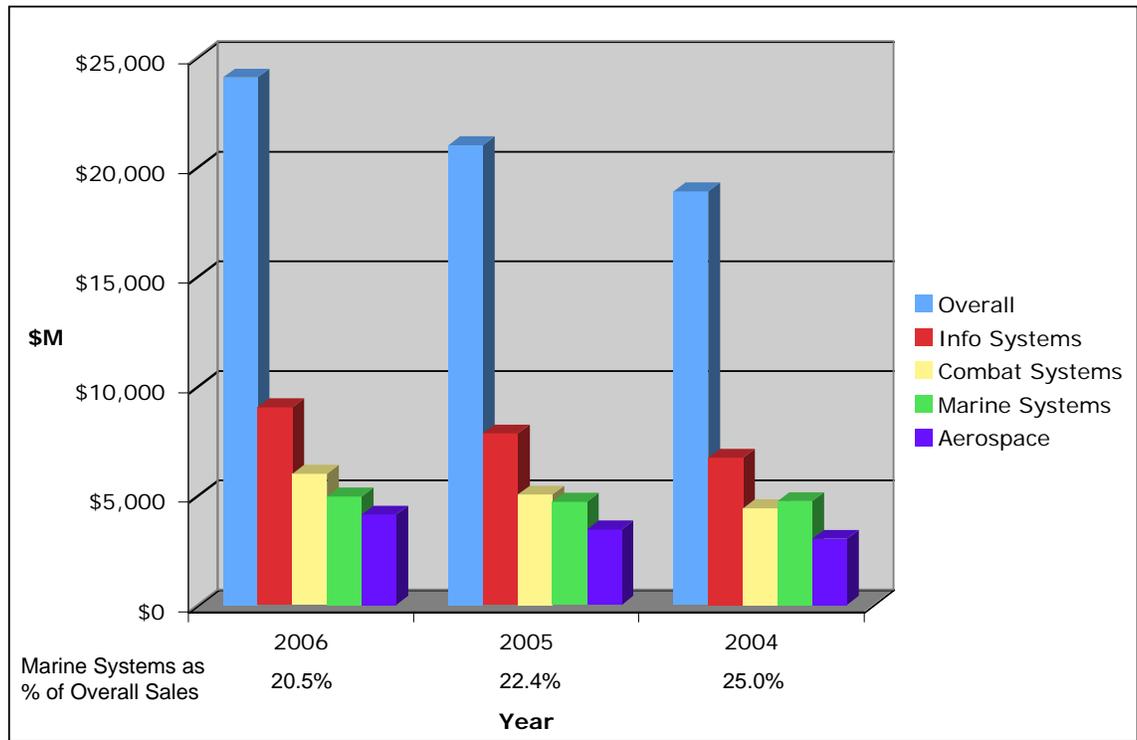


Figure 5. General Dynamics Net Sales by Business Segment [From: General Dynamics Annual Report, 2007]

Figure 6 shows General Dynamic’s profit margins by business segment. In terms of 2006 profit, Marine Systems ranks last, \$269 million behind third-ranked Aerospace and over \$600 million behind first-ranked Information Systems.

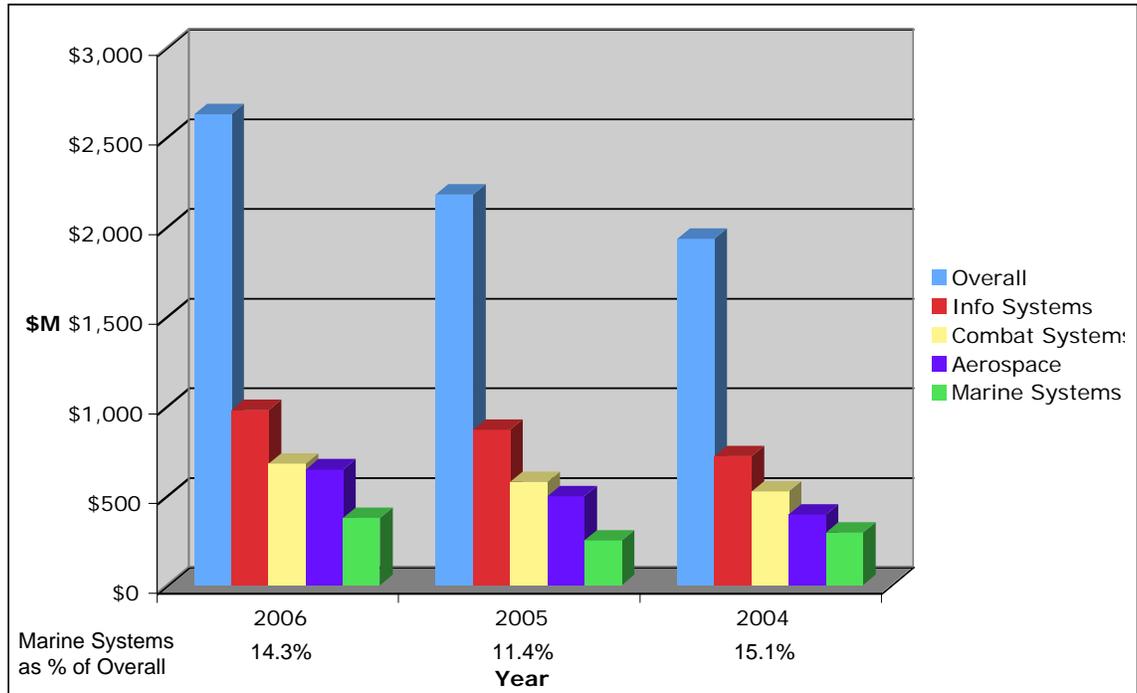


Figure 6. General Dynamics Profit Margins by Business Segment [From: General Dynamics Annual Report, 2007]

### 3. Return on Investment and Opportunity Costs

Financial ratio analysis is an important step investors use to determine the profitability of a company and ultimately, whether or not to invest money in that company. Return on investment (ROI) applies ratios measuring the income earned from invested capital and the ability of the firm to reward investors providing long-term funds and attract future investors (Gibson, 2007). This ratio is widely seen as the ultimate measure of corporate performance (Reuters, 2007). Operating margin is a measure of profitability determining how much of each sales dollar remains after subtracting direct costs of generating sales and direct costs such as overhead from total revenue and then dividing that figure by total revenue (Gibson, 2007; Reuters, 2007). Table 3 displays the return on investment and operating margin of both Northrop Grumman and General Dynamics. Due to the limitations of publicly available material, the ROI figures provided below are for the entire company, not just the shipbuilding units. While this impedes determining the specific performance of each company's shipbuilding units,

investors invest in the entire company, not just a specific business segment. Both companies are classified in the aerospace and defense industry and the capital goods sector. The S&P 500 is used to represent the market as a whole. Of note, ROI and operating margin are calculated using a five-year average. Table 3 shows that General Dynamics outperforms Northrop Grumman in both ROI and operating margin. General Dynamics also outperforms the industry and sector averages.

	<b>Company</b>	<b>Industry</b>	<b>Sector</b>	<b>S&amp;P 500</b>
<b>Northrop-Grumman</b> ROI	4.00	7.66	8.07	11.04
Op. Margin	6.93	7.08	7.97	19.01
<b>General Dynamics</b> ROI	12.02	7.66	8.07	11.04
Op. Margin	10.83	7.08	7.97	19.01

Table 2. Return on Investment and Operating Margin as Percentages [From: Reuters, 2007]

The opportunity cost of an item is what is given up to get that item (Mankiw, 2004). For an investor to invest in either of these two companies, he or she gives up an opportunity to place that money in some other investment. In studying this decision making process, economists include opportunity cost because these costs effect the decision of the investor (Mankiw, 2004). It is logical to assume investors will place their money in an investment that yields them the highest return for a given risk factor, thus lowering their opportunity cost. Porter (1980) suggests using government securities as a floor rate with which to measure the opportunity cost of capital. As such, table 4 compares the return on investment of Northrop Grumman and General Dynamics to the Ten Year U.S. Treasury Note, a stable, long-term government security.

	<b>10y T-Note</b>	<b>Northrop Grumman</b>	<b>General Dynamics</b>
<b>ROI</b>	4.39	4.00	12.02

Table 3. Return on Investment vs. 10y T-Note [From: Reuters, 2007]

Because Northrop Grumman lags behind its competitor, industry and sector averages, the S&P 500, and the 10-Year Treasury Note, their stake in the shipbuilding plan could reasonably be considered to be more urgent and thus, an increased salience.

## C. LABOR

Employees and labor challenges are a significant issue with which shipbuilders must contend. “The U.S. Shipbuilding industry lost approximately 150,000 skilled employees since the late 1980s, mostly due to the stagnant market” (Shipbuilding Industry Study, 2004, p. 13). The greatest shortages are for welders, ship fitters, and pipe fitters. During economic downturns in the industry, companies are forced to lay-off employees and because of the lack of job security, many workers seek employment in more stable industries (Shipbuilding Industry Study, 2004). General Dynamics (2007) states, “Because of the highly specialized nature of its business, the company must be able to hire and retain the skilled and appropriately qualified personnel necessary to perform the services required by its customers. If the company is unable to develop new products that meet customers’ changing needs or successfully attract and retain qualified personnel, future sales and earnings may be adversely affected” (p. 15).

Labor is also a key determinant in productivity and efficiency and represents a substantial portion of the total procurement cost of naval ships (RAND, 2006). These labor shortages have led to cost over-runs, outsourcing, and delays in project completion (Shipbuilding Industry Study, 2004). The GAO (2005) reports that data from case study ships – DDG 91 and 92, CVN 76 and 77, LPD 17 and 18, and SSN 774 and 775, shows a cost growth of \$457 million due to increased labor hours. Labor represents 51 percent of the end cost for an aircraft carrier, 47 percent for an amphibious ship, 39 percent for an attack submarine, and 32 percent for surface combatant (RAND, 2006).

In addition to recruiting and retaining skilled workers, another challenge the industry faces is an aging workforce. Industry estimates show the average worker is in their late 40s to early 50s. The impending retirements of these workers will further hamper the industry’s labor market. These retirements will also place an increased financial burden on industry as more and more workers begin drawing their pensions (Shipbuilding Industry Study, 2004). Some of the \$457 million in overhead increases is due to increased benefits like pensions and medical care costs (GAO, 2005). RAND (2006) reports that from 1977 to 2005, the burdened labor rate, the rate the Navy pays for

labor, increased at an annual rate of 5.5 percent. This is 1.3 percent higher than the annual consumer price index during the same time period. Shipyards attribute this increase to higher health care costs, increased disability costs, and a declining business base. Of note, direct pay to workers kept pace with the consumer price index (RAND, 2006).

The competitive forces experienced by the Big Six shipyards, constant financial performance pressures, and a troubled labor market help explain the behavior of shipbuilders. This chapter uses Porter's (1980) framework to examine the five competitive forces with which Northrop Grumman and General Dynamics must deal. Rivalry in this industry is not overly intense, ultimately benefiting the industry. While both companies to compete with one another for Navy shipbuilding contracts, the two companies also partner with each other on various programs, like sharing construction contracts for the Arleigh Burke (DDG 51) Class destroyer for example. Additionally, the federal government desires that all the shipyards owned and operated by General Dynamics and Northrop Grumman remain open in order to maintain the United States' ability to build ships and to maintain strong local economies. There is only one primary buyer of ships, the U.S. Navy, which normally gives that buyer the power to drive down prices. However, this buyer power is offset because there are only two primary suppliers of ships. Buyer power, therefore, can best be described as neutral in this market. Suppliers of shipbuilding materials are marked by high concentration and there is a lack of substitute supplies for shipyards to purchase. Because of the importance of these supplier's products, shipbuilders are vulnerable to suppliers who enjoy a moderate amount of power in this industry. The threat of new entrants into this market is low because of the advantages of economies of scale enjoyed by existing firms, significant barriers to entry, and a great deal of consolidation having already occurred in this industry. This low threat of new entrants benefits existing firms. Finally, there are no substitute products threatening these companies, providing another benefit to existing firms. As a whole, the three of the five competitive forces benefit existing firms in the industry, one is neutral, and only one negatively impacts the industry.

An examination of available financial data reveals that the shipbuilding segments of these two parent companies rank last in terms of operating margin, with Northrop Grumman Ship Systems also ranking last in net sales and General Dynamics Marine Systems ranking third out of four in new sales. This indicates that these business units are the least profitable for their respective parent company. Both units are still profitable, however, with Ship Systems providing 14.1 percent of Northrop Grumman's 2006 operating margins and Marine Systems providing 14.3 percent of General Dynamic's operating margin in that same year. Concerning the company-wide return on investment, only General Dynamics bests the industry, sector, and S&P 500. Northrop Grumman lags behind all three. When compared to the return on investment of the 10 Year Treasury Note, General Dynamics once again exceeds this measure while Northrop Grumman falls short. Based on this, it could be reasonably expected for Northrop Grumman's concerns regarding the Navy's shipbuilding plan to have a higher salience due to the potential increased urgency of their limited financial performance.

Labor is great concern for shipbuilders. Unstable work creates job insecurity for the highly skilled workers needed to build ships. These workers moved into other industries that provide greater job security and the companies have not recovered from this worker migration. This insecurity also causes these companies difficulty in hiring and retaining workers. Labor is a key determinant in productivity and efficiency and represents a substantial portion of the total procurement cost of naval ships. Increased labor hours are already a major source of overhead cost growth as demonstrated in the construction of recent ships purchased by the Navy. An aging work force compounds this labor problem. As workers age and retire, health care and pension costs increase, something these companies are beginning to experience as a portion of this labor overhead cost growth is due to these costs.

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## VII. CONCLUSION AND RECOMMENDATIONS

### A. DISCUSSION AND RECOMMENDATIONS

Navy managers must understand stakeholders of the shipbuilding plan and their relationships before developing strategies to manage them. While broad research has generically termed the relationship that exists between Congress, the Department of Defense, and defense contractors the iron triangle, figure 7 depicts, in the stakeholder environment model, the iron triangle as it applies to the Navy's Thirty-Year Shipbuilding Plan. Congress, the Navy's shipbuilding plan, and the shipbuilders form the three points of the triangle. The legs of the triangle, which connect these three points, show the methods of influence each has on other. The stakeholder environment model adds the various stakeholders, shown in the boxes, who exert pressures upon each of these entities.

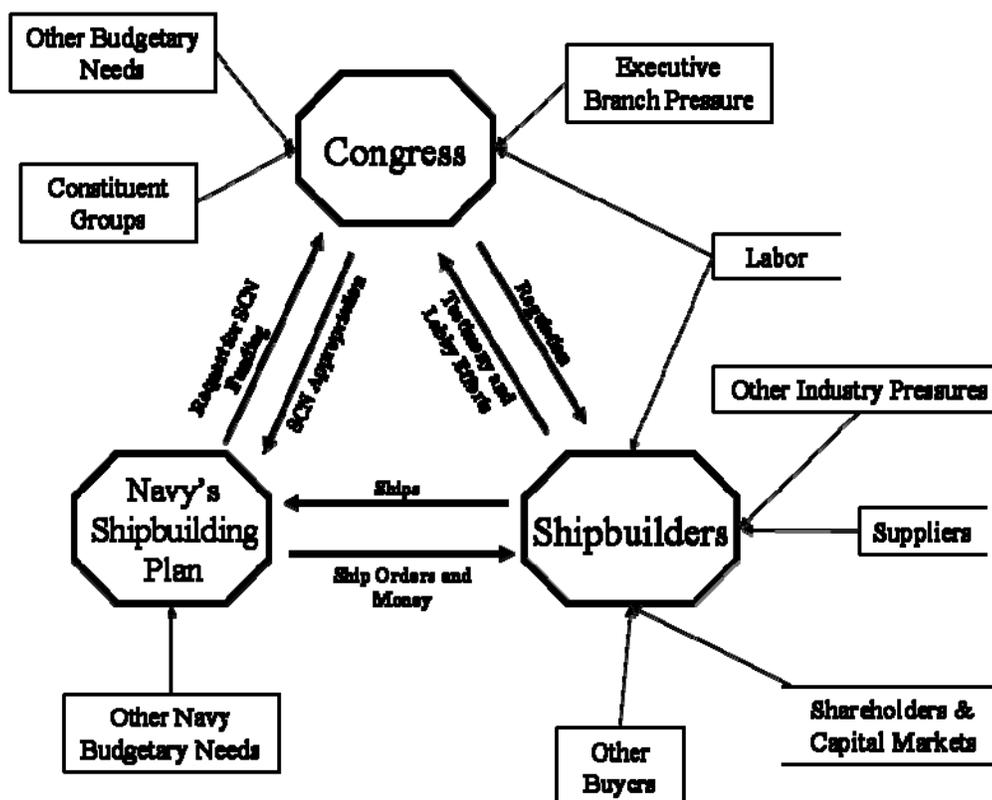


Figure 7. Shipbuilding Plan Stakeholder Relationships [After: Freeman, 1984]

This thesis specifically examines shipbuilders, defining their current behavior and explaining why they might be behaving in this fashion. Armed with this understanding, Navy managers can begin to focus on individual stakeholder strategies to manage this stakeholder group. As such, are scathing rebukes and tough love the correct approach for the Navy to take with shipbuilders? To answer this question, Frooman (1999) offers guidance. The relationship between the Navy and shipbuilders is one of mutual dependence. Mutual dependence exists when there is reciprocal exposure between the firm and stakeholder (Frooman, 1999). Shipbuilders rely almost entirely on the Navy for their income and the Navy relies on shipbuilders to supply the Fleet with warships and supporting vessels. Neither the Navy nor shipbuilders can walk away from each other. Frooman (1999) says of mutual dependence, “The welfare of each will be linked to the other, so each will do well only by attending to needs of the other” (p. 197). Shipbuilders are also dependent stakeholders, meaning they rely on others to carry out their will (Mitchell, et al., 1997). Frooman (1999) defines indirect strategies as those “in which the stakeholder works through an ally by having the ally manipulate the flow of resources to the firm” (p. 198). Shipbuilders can be expected to use indirect strategies by asking for help from Congress, a dominant stakeholder. This has already been evidenced by their reluctance to confront the Navy in court regarding money owed them by the Navy as well as other proposed legislative language from Congressional testimony.

In order to avoid Congressional mandates and restrictions that come from shipbuilders’ indirect strategies, the Navy should make efforts to address the concerns of shipbuilders so they will not need to seek help from Congress. This thesis discussed some of shipbuilder’s biggest concerns: increased stability, longer production runs, and reducing change orders. These are best summed as the ability to integrate practices of best-in-class shipyards in order to reduce the higher costs of operating a job-shop business model. By changing and bettering the business cases currently in use, the Navy signals a spirit of cooperation with shipbuilders, keeping with the tenants of a mutually dependent relationship. Moreover, bettering current business cases allows the Navy to achieve one of the primary goals of the shipbuilding plan as outlined by Admiral Mullen: stability in the shipbuilding industry. Stability from the perspective of shipbuilders is not

just deciding on a specific number of ships in the Fleet, but the number of ships ordered from year to year. When the numbers in the shipbuilding plan fluctuate each year, shipyards cannot plan how much material to buy, what labor requirements will be, and whether they will be able to build enough ships to offset capital investment costs, an important factor in determining if those investments should even be made. Stability allows shipbuilders to better control costs, which is something both the Navy and Congress want.

Therefore, in order to develop a cooperative stakeholder strategy, the Navy must make a commitment to year-to-year shipbuilding plan stability by bettering business cases and industry firms must make a commitment to control costs. To better business cases and accomplish year-to-year stability, this thesis recommends adopting the recommendations proposed by the GAO in its July 2007 report to Congress entitled “Realistic Business Cases Needed to Execute Navy Shipbuilding Programs.” The GAO suggests the Navy adopt a knowledge-based management framework. This framework requires that technological maturity must be proven before designs can be considered stable and production outcomes being guaranteed only after these designs are stable (Francis, 2007). Additionally, the GAO recommends the Navy improve cost estimating practices, which allows initial shipbuilding budgets to be realistically achievable, and that the Navy increase the use of fixed-price contracting and comprehensive cost surveillance, which improve overall cost management (Francis, 2007).

## **B. SUGGESTIONS FOR FUTURE RESEARCH**

Future research should examine the effect of unions on the shipbuilding industry. Unions are an important piece of the overall labor picture. They exact higher wages and better benefits for their members, which translate to higher costs for shipbuilders. Additionally, unions set forth qualification standards for their members, with higher qualified members receiving more compensation for their labor. As technology increases, workers must have ever increasing qualification levels, further increasing shipbuilder’s labor costs. Due to the limitations of publicly available information, this

thesis was unable to examine this portion of labor pressures on Northrop Grumman Ship Systems and General Dynamics Marine Systems.

Freeman's model calls for examination of all stakeholders. Future researchers should examine Congress, the other key stakeholder to the Navy's Thirty-Year Shipbuilding Plan. Budgetary matters are always highly political. Congress as a whole has overarching goals, which include but are not limited to reducing federal deficit spending and providing national security. However, each Congressman and Senator represents a specific constituency. Reelection often depends on local economic conditions, including employment. Winning defense contracts can bring or keep jobs and money in states and districts. By understanding these varied, dynamic environments, Navy shipbuilding planners can anticipate how individual Congressmen and Senators and Congress as a body might react to shipbuilding plans, and subsequently develop individual strategies to manage this stakeholder group. Additionally, future research should examine internal Navy pressures and the competition for and trade-offs between acquisitions programs that occur because of the demands for the Navy's budgetary dollars. After studying all the key external stakeholders in the iron triangle – defense contractors and Congress – integrated stakeholder strategies can be developed, completing Freeman's final step in his stakeholder analysis process.

Future research might also include how stakeholder perception plays a role in stakeholder strategy development. For example, shipbuilders might underestimate their influential power on the Navy, perceiving it to be weaker than it actually is. If the perception of power determines what courses of action they might take and should they perceive a stronger position, they might become more aggressive and confrontational in influencing the shipbuilding plan in their favor. They might, for example, file a lawsuit over unpaid bills and take the issue to court, something they thus far have been unwilling to do.

Finally, recent trends in the Department of Defense and other government agencies indicate a greater tendency toward privatization, believing the private sector brings about better results than business operations run by the government. This is indicative of the Navy divesting itself of public, Navy-run shipyards in the last few

decades. Future research could examine whether the assumptions of better results in the private market place are true. If they are true, to what extent and if these assumptions are not true, should the Navy attempt vertical integration by returning to public, Navy-run yards for their shipbuilding needs?

Applying Freeman's (1984) stakeholder management model to the Navy's Thirty-Year Shipbuilding plan, this thesis determines who the key stakeholders are with regard to this plan, specifically analyzes shipbuilder's behavior, and explains their behavior. In so doing, Navy shipbuilding plan managers have a better understanding of their external environment and can begin to formulate or revise strategies and practices that address the issues of this particular stakeholder group.

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