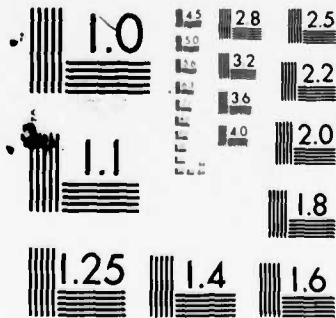


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US SHIPBUILDING: THE SEVENTIES IN RETROSPECT/THE PROSPECTS FOR --ETC(U)
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US Shipbuilding:

The Seventies in Retrospect/

The Prospects for the Eighties

James R. Fisher
and
Phillip J. Coady

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US SHIPBUILDING:
THE SEVENTIES IN RETROSPECT/
THE PROSPECTS FOR THE EIGHTIES

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by

(10)

Captain James Ronald Fisher, USN
and
Commander Philip J. Coady, USN
Associate Research Fellows

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The National Security Affairs Issue Papers

This paper is one of a series of brief research studies on national security issues. The series supplements the National Security Affairs Monographs, which are lengthier studies of more general interest. Papers in both series generally are researched and written by the Research Fellows, faculty, students, and associates of the National Defense University and its component institutions, the National War College and the Industrial College of the Armed Forces.

The purpose of this series is to contribute new insights and background materials to national security policymakers and to others concerned with the many facets of US national security.

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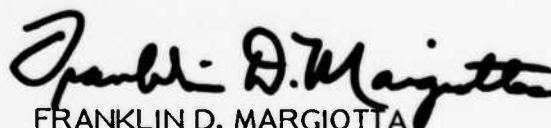
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FOREWORD

In this latest of our NDU Press National Security Affairs Issue Papers, two of our naval officer Fellows review the recent turbulent history of the US shipbuilding industry, look at its present status, and suggest its prospects for the decade ahead. The authors, Captain James R. Fisher and Commander Philip J. Coady, suggest that maritime policy and the trend of market forces could jeopardize a vital national security asset.

The authors bring first-hand knowledge of the sea and shipbuilding to their research. They contend that the projected continued decline in US shipbuilding will seriously reduce US mobilization potential and that reductions in the skilled workforce will make any buildup very difficult, noting the irony that the industry should reach its lowest state just when national concern about strategic mobility is growing.

The authors see little prospect for changes in government policy that would be favorable toward the maritime industry. Despite the probability of even greater reductions in shipbuilding as a result of reduced customer demand, the writers remind us that the political realities of shipbuilding cause it to be "protected" from market forces. And, they add, the Nation pays a price for this regional protectionism in terms of higher prices for the products it procures. Fisher and Coady warn that some major changes in US maritime policy will be necessary to secure the minimum mobilization capacity required for the Nation's defense. Their paper thus well serves the purpose of our Issue Paper series--to provide another source of intellectual challenge and ideas for the ongoing dialogue essential to make rational policy choices in a rapidly changing world.



FRANKLIN D. MARGIOTTA
Colonel, USAF
Director of Research

ABOUT THE AUTHORS

This paper was prepared while the authors were both associate research fellows in the Research Directorate of the National Defense University and students at the Industrial College of the Armed Forces, Fort McNair, Washington, DC.

Captain Ronald Fisher is a graduate of the US Naval Academy, Class of 1958, has an MA degree in Management, and is an Engineering Duty Officer. He served in a destroyer, four different attack and fleet ballistic missile submarines, as Training Officer of the Nuclear Propulsion Training Unit, West Milton, New York, and at Charleston Naval Shipyard. He went to the National Defense University from duty in the Industrial Management Directorate of Naval Sea Systems Command (NAVSEA). He currently is assigned to the Submarine Platform Directorate in NAVSEA.

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US SHIPBUILDING: THE SEVENTIES IN RETROSPECT/ THE PROSPECTS FOR THE EIGHTIES

In the life of every industry, there are periods of intensive, irreversible structural changes. Technological innovation, represented by containerization and supertankers, precipitated one such "watershed" for the ocean shipping industry in the early seventies.

→ A continuing decline in the US shipbuilding industry is currently forecast based on projected naval and commercial shipbuilding programs. Of primary concern is that this decline will seriously reduce the mobilization potential of the country and that reductions in the skilled work force will make any required buildup very difficult both in the primary and supporting shipbuilding industries.

It is ironic that the industry should have reached its current low state just when national awareness of the need for strategic mobility is at a post-war high. In all of our previous wars and most of our overseas crises, the US Navy, merchant marine and shipbuilding industry have played very important roles. This is still the case for the ongoing crisis in southwestern Asia and will not change for future crises and conflicts. As the world's population and trade grow and as we turn to the sea for more of its resources, we see even greater importance for our maritime industries.

The purpose of this paper is to review the current status of the shipbuilding industry, recount the factors that led to the current condition, and examine the prospects for proposed changes in government policy which, if enacted, signal major new directions in the shipbuilding industry.

NOTE: This paper first appeared in the August 1980 issue of Naval Engineers Journal, published by the American Society of Naval Engineers.

US ROLE IN THE WORLD MARKET

The United States has not been a major competitor in the worldwide commercial shipbuilding market since the 1950s due to the high labor and material costs here. Nonetheless, bright prospects in the late 1960s for a range of high-technology ships, for which the United States possessed a comparative advantage, induced substantial investments in new facilities. Facilities for the production of liquified natural gas (LNG) tankers were established in several US yards to exploit what was viewed as an expanding market. Container ships, LASH SEABEE, roll-on/roll-off, and supertankers were all part of the boom, and shipyard facilities were modified to construct them.

The worldwide shipbuilding industry has undergone boom-and-bust cycles in its checkered past but rarely has it matched the glow of expectation and the gloom of despair which characterized the 1970s. Between 1970 and 1975 the world fleet increased by approximately 70 percent on a deadweight basis (cargo capacity) and by 58 percent on a gross registered tonnage (empty weight) basis. In 1973, the peak year of the shipbuilding boom, outstanding orders for new ships were 72 percent above 1970 order book figures on a tonnage basis. Viewed from another perspective, the 1973 order book was equivalent in deadweight tonnage to 50 percent of the existing world fleet.

Given that boom in orders, it is not surprising that many marginal producers were kept in the industry and that new builders entered the business, particularly low-cost builders in Japan, Brazil, Korea, and Poland. Japan alone increased its annual capacity from 1.7 million to 17 million gross tons between 1960 and 1975.

At the peak of the boom, the US shipbuilding industry shared in these new orders, despite high labor costs. New contract awards for merchant shipping in US yards grew from 13 ships in 1970 to 48 in 1972. Yards everywhere were expanded; dormant ways, such as the old Brooklyn Navy Yard, were converted into productive commercial facilities.

The dramatic contraction in new orders which followed the Arab oil embargo of 1973 is familiar to all who follow this industry. In the United States, new commercial orders fell from the 1972 peak of 48 ships to 14 ships in 1975 and bottomed at 13 ships in 1977. The decline in tonnage being ordered was even more dramatic as supertanker orders dwindled; many tankers were laid up as they were completed.

The US decline was neither the worst nor the most dramatic. The worldwide order book declined from a peak 133.4 million gross tons in March 1974 to 25 million in the first quarter of 1979, with 80 percent of that tonnage scheduled for completion by the end of 1980. The contraction was felt most in the high-cost shipbuilding countries; however, every major shipbuilding nation felt the pinch. Sweden and Britain were forced to nationalize their shipbuilding firms to prevent multiple bankruptcies. Similar choices might have confronted the US Government if the shipbuilding industry in this country had been composed of individual independent firms. The diversified conglomerates which own all but two of the major US shipbuilders were able to sustain these yards through the sharp decline in new business. Nonetheless, yard closures did occur and threats of further closures still persist. Sea Train was forced to cease its shipbuilding activities and two larger yards, Bethlehem's Sparrows Point Yard and General Dynamics' Quincy facility, were reported to be tottering on the brink of closure.

Simultaneously, Japanese shipbuilders, who for years had enjoyed the most cost competitive position in the industry, found themselves surprisingly vulnerable to the worldwide depression in shipbuilding. The shipyards which had sprung up in Korea and Brazil, with substantially lower labor costs, had displaced Japan as the lowest cost producer of unsophisticated ships. Thus, when the contraction came, Japan was also infected by a wave of bankruptcies and closures. Yards with idle workers and idle capacity chased an ever-diminishing number of new orders, bidding below cost, at times, to keep some work in the yards. Despite a long tradition of work force stability and guaranteed employment, even such giants as Mitsubishi Heavy Industries were forced to lay off a third of the workers in their shipbuilding facilities. By the end of 1979, 43 Japanese yards had gone bankrupt according to the Shipbuilders Association of Japan.

In summary, the governments in most shipbuilding nations nationalized or restructured portions of their shipbuilding industry using massive grants, subsidies and low interest loans; in some cases inefficient, high-cost producers were allowed to go under.

Shipbuilders of the United States and Western Europe face a bleak future. With their relatively high labor costs, they are confronted by mounting losses, falling employment, possible insolvency, and more governmental intervention in the market place.

Against this background, we next examine the current status of the US ship work market; its profits, employment and principal customers; its outlook for the future; and, perhaps most important, the role of government.

THE US SHIPBUILDING INDUSTRY

Current Industry Structure

The US shipbuilding and ship repair industry is made up of about 250 private firms involved to varying degrees in repairing or building ships and 8 naval shipyards owned and operated by the Government and numerous supporting industries and subcontractors. The yards vary widely in size, facilities, employment, technology, products, management, and type of ownership.

The annual "Report on Survey of US Shipbuilding and Ship Repair Facilities" by the Maritime Administration (MARAD) provides an excellent description of the private shipbuilding and ship repair industry. This report defines a major shipyard as one having at least one building position for a ship 475 feet long with a 68 foot beam. Although ships that size are small by today's standards, this is the criterion for the smallest ship that would be considered for mass production during mobilization. By this criterion, there are currently 27 active major shipyards, but only 19 are currently building oceangoing ships.

The US Navy further classifies 12 of these yards as "principal builders of Navy ships." These 12 yards, arranged in Table 1 by employment levels, account for about 60 percent of all employment in the private shipbuilding and ship repair industry. Nine of these 12 private yards are building naval ships at present. Four of the nine yards building naval vessels are also building commercial ships of 1,000 gross tons or more.

In addition to the 27 active major shipyards which both build and repair ships, there are about 18 major US ship repair yards concentrating on repairs and overhauls of naval ships and ocean-going merchant ships. These 18 repair yards employ about 12,500 people. There are also about 160 small ship repair facilities which are often called "topside" yards. These usually have limited pier facilities but no drydocks and many specialize in sending repair teams to ships rather than having the ship enter a yard.

A vital element of the mobilization base, the eight naval shipyards perform complex naval ship overhauls, conversions, short refits and other fleet support tasks. No ship has been

TABLE 1						
SHIPYARD LOCATION	EMPLOYMENT (Early 1980)	MAX LENGTH CAPABILITY (feet)	MAJOR NAVY CONSTRUCTION		MAJOR COMMERCIAL CONSTRUCTION ¹	
			TYPES UNDER CONTRACT	OTHER MAJOR PAST CONSTRUCTION ¹	TYPES UNDER CONTRACT	OTHER MAJOR PAST CONSTRUCTION
Electric Boat Division General Dynamics Groton, Conn.	22,954	690	SSN, SSBN	All Types SS	—	—
Newport News Shipbuilding Co. Tenneco Newport News, Va.	21,939	1,600	CVN, CGN SSN	CV, AS, SSBN, LKA	—	All Types Including SS United States, LNG, & ULCC
Ingalls Shipbuilding Litton Industries Pascagoula, Miss.	12,060	820	DD, LHA, DDG, CG	SSN, LPH, LPO, LSD, AE, AS	—	Cargo, TKR CTNR
Avondale Shipyards Ogden Corporation New Orleans, La.	7,672	1,200	AO	DDG, FF	LNG, TKR, LASH, TB, CTNR	All Types
National Steel & Shipbldg. Co., NASSCO Morrison Knudsen Co. San Diego, Calif.	6,467	980	AD, T-ARC	AOR, AFS, LST	TKR	Cargo, OBOs, Miscel, Craft
Bath Iron Works Cingoleum Corporation Bath, Maine	6,044	700	FFG	CG, DDG, DD	CTNR	RO, RO, TKR
Sun Shipbuilding Sun Oil Company Chester, Pa.	4,312	1,100 ²	—	—	TB, TKR, CTNR, RO, RO	All Types Including VLCC & <i>Glomar Explorer</i>
Quincy Shipbuilding Div. General Dynamics Quincy, Mass.	3,787	936	—	SSN, CGN, DDG, DD, LSD, AOR, AS, AE	LNG	SEABEE, TKR
Todd Seattle Shipyard Seattle, Washington	3,730	550	FFG	CG, DDG, FF	—	TB, Ferries
Todd Los Angeles Shipyard San Pedro, Calif.	3,387	800	FFG	FF	—	TB, Ferries
Sparrows Point Shipyard Bethlehem Steel Baltimore, Md.	2,742	1,200	—	AE, ARDM	CNTR, TB	VLCC
Lockheed Shipbuilding and Construction Company Seattle, Washington	1,960	700	AS	CG, ODG, DD FFG, FF, LPD	—	RO, RO, Bulk Carriers, Ferries, Ice Breakers

NOTES: 1. Since 1950.

2. By welding two 700-foot sections in the water, a 1,400-foot long ship could be built at Sun Ship.

3. Key: CNTR—Container; LASH—Lighter Aboard Ship; LNG—Liquefied Natural Gas Tanker; OBO—Ore/Bulk/Oil; RO/RO—Roll-On/Roll-Off; SEABEE—Sea Barge Carrier; TB—Combination Tug Barge; TKR—Tanker; ULCC—Ultra Large Crude Carrier; VLCC—Very Large Crude Carrier.

built in a naval shipyard since delivery of the last submarine from Mare Island in September 1972.

Ownership and Profitability

All of the shipyards in Table I (except for the two Todd yards) and many of the other larger US yards are owned by conglomerates. The smaller yards are largely privately owned.

Profit and loss data for US shipbuilders are difficult to amass since conglomerate owners may mask shipbuilding profits or losses on annual reports. Nonetheless, various studies have found that overall shipbuilding industry profits are generally low. The "Profit 76" study, with data through 1974, found that profits on defense contracts were generally lower than profits on commercial endeavors, and more specifically, that shipbuilding profits were "less than satisfactory." Shipbuilding profits were only 25 percent to 40 percent of the profit rates reported in other defense industries. A recent, comprehensive report, "Profitability of the US Shipbuilding Industry" by Mr. Edward M. Kaitz, confirmed that shipbuilding profits were generally less than satisfactory and described a two-tiered industry. He concluded that the conservative "old line shipbuilding firms fared better than newer aerospace entrants into the industry," that no evidence could be found that Navy construction was any more or less profitable than commercial construction and, lastly, that a "firm's profitability may be more a function of the quality of its management" than it is of the general shipbuilding economic environment.

Other evidence indicates that the yards suffering the largest losses in recent years were owned by firms engaged in diverse business activity. These firms could reduce their tax liability by using losses from shipbuilding to offset profits from other activities. Thus the Government "shared" these losses since the tax payments on the profitable operations were reduced by 46-48 percent of the loss on shipbuilding activity. Contrast this with firms engaged in shipwork only, such as Todd, which do not have the diversified firm's advantage of using losses from ship operations to reduce overall tax liability when shipwork is slipping.

Cash flow is nearly as important as profits to the parent firm (some would say even more important). A division which is losing money can still be a major contributor to cash flow if its losses involve primarily non-fund expenses such as plant depreciation. Thus, shipbuilding divisions, even during an earnings slump, can generate substantial cash flow for a corporate parent. Long-term profitability is, of course, the final aim.

The ownership structure of US yards has been very beneficial in the current shipbuilding slump. Indeed, it can be stated that the financial backing of conglomerate owners is a primary reason why US yards have stayed open and productive. Some would speculate that the US Government would have been forced to nationalize its shipbuilders if the conglomerates had not owned the yards. While it is doubtful that legislation for nationalization could have cleared the Congress, it is certain that shipyard failures, which otherwise would have occurred, would have elevated the crisis into the national spotlight as it did in Sweden, Britain, Japan, and elsewhere.

Labor Force, Wages, and Employment Levels

Skilled craftsmen make up about 53 percent of the total work force of the US shipbuilding industry. In general, the industry hires the unskilled and trains them to be welders, machinists, shipfitters, pipefitters, electricians, riggers, crane operators, and the many other different trades required to build and repair ships. At the beginning of 1979, the basic hourly wage for a first class machinist varied from \$6.64 to \$9.27, depending upon the yard and location. In many areas, shipyard wages are lower than the maximum paid by other industries. For example, in January 1980, construction industry weekly wages averaged \$332 per week for a 35.1-hour work week compared to \$321 for a 39.8-hour work week in the shipbuilding industry.

The tendency for workers to master a skill and then move on to higher paying or more secure jobs, combined with layoffs due to fluctuating and ill-distributed workloads, causes high turnover rates. The average monthly accession and separation rates for the industry in 1979 were 6.9 and 6.4 percent respectively. Such turnover rates decrease productivity and require compensating training programs. The single factor that would best decrease these turnover rates would be stable, predictable workloads.

A Harbridge House study completed in July 1979 found that, contrary to popular opinion, private shipyards have a relatively young labor force. Based on a survey of seven representative shipyards, the study found that 67 percent of the work force was 40 or younger and only 5.2 percent was over 60. The study also found that large numbers of skilled shipyard workers were relatively new employees; 83 percent of the pipefitters and electricians and 71 percent of the machinists had been employed for 5 years or less.

Fluctuations and predicted declines in employment are well documented and have been widely discussed. Employment in private shipyards fell from a post World War II high of 180,800 at the beginning of 1978 to a low of 155,100 in April 1979. By February 1980, employment was back up to 164,900. Reductions of 20,000 to 40,000 by the mid-1980s are predicted on the basis of Navy shipbuilding plans and projected commercial work. These decreases would reduce total employment to about where it was at the beginning of the seventies. While total industry fluctuations are extreme, individual shipyard employment fluctuations are even more pronounced.

In addition to the private shipyards, employment in the related boat building and boat repair industry was 46,100 in February 1980, down 10,000 over the past 12 months. Total civilian employment in the eight naval shipyards was 70,400 in April 1980.

Technology

Despite investments over the past few years, US shipyards, in comparison to modern foreign shipyards, generally use a lower level of technology in several critical areas. This was the major finding of the 1978 Technological Survey of Major US Shipyards conducted by Marine Equipment Leasing, Inc., for the Maritime Administration. For this survey, sophisticated technological standards were utilized to compare 13 major US yards with shipyards in seven foreign countries, with special emphasis on Japan due to its preeminence in shipbuilding.

The survey found, in general, that technological levels were lower in medium-size US yards than in their foreign counterparts, that very large yards here and abroad used high technology, and that little advanced technology was utilized by US or foreign small yards. The survey also found that the critical areas of low technology in US yards were primarily management and system oriented, that US shipyards are outstanding in some areas, and that low technology was being utilized in 16 labor-intensive or labor-sensitive areas. The survey did not perform a cost benefit analysis of using more advanced technology but indicated that: improvements in 9 of the 16 areas would depend primarily upon management initiative and only minor capital investment; that improvement in 5 of the areas could be made with modest capital investment; and that improvement in the other 2 areas requires major investments. It should be borne in mind that these comments do not apply to all US shipyards. Also, the US market has

rarely required construction of a series of similar ships that would make "super" automation economical. However, there are definite economic benefits that can be gained in applying technology to areas such as subassembly fabrication.

In general, US shipyard management is adopting new technology, and further studies are being conducted and acted on. In particular, a large Japanese firm, under a joint contract with specific shipyards and MARAD, is working directly with the US industry on technology, processes, and management techniques; the results in at least two shipyards are excellent.

One should note that high technology, while important, is not the touchstone for success in shipbuilding, especially not in a depressed shipbuilding market. Witness the example of Kockums, a Swedish firm of vaunted technological sophistication. Despite its technology, Kockums was forced to seek the shelter of nationalization as an alternative to bankruptcy. This was primarily because low-volume shipbuilding is inherently labor-intensive and Swedish labor is expensive. Capital can very effectively substitute for labor if the work is sufficiently repetitive in nature or can be engineered to become repetitive. An example of the latter is the design practice followed in the highly automated panel shop at General Dynamics' Quincy operation. By careful engineering, GD-Quincy was able to design its LNG ships so that 60 percent of the panels utilized in the hull were identical.

Clearly, the optimum utilization of technology would be in series production of a large number of identical ships. The predictability of such longrun series productions is a prerequisite for large capital investments. The dynamics of shipbuilding in this country has often proved that there is definite bias to overstate the likelihood of long runs. Consequently, capital investment in facilities has often proven to be unprofitable when workload failed to meet expectations. However, if the market does not demand long runs, then technology can be employed profitably in a limited number of instances.

Business Volume and Political Leverage

The US shipbuilding and ship repair industry ranks about 40th in dollar volume of business among US industries and contributes about \$7 billion (about 0.3 percent) to the gross national product each year. The total annual industry business volume is about the same as K-Mart's annual sales and about two-thirds of Chrysler's volume. Due to this relatively low

volume, the shipwork industry, by itself, lacks extensive political clout; however, in the past the industry has gained leverage by joining forces with other maritime interests such as shipping lines and maritime unions. When the three sectors make common cause they have substantial political influence, in large measure because of the sizeable political contribution of the maritime unions. The shipbuilders lose much of their political muscle when their goals conflict with those of the shippers and unions.

MARKETS FOR THE US SHIPBUILDING INDUSTRY

Since the US industry is not cost competitive on the world market for most commercial shipbuilding orders, its main market is provided by the US Government, especially when the world commercial market is in a slump. The US Navy shipbuilding program comprised 77 percent by employment of the new construction work in US yards during the last quarter of 1979. The remainder of the new construction work came from American-flag shipping lines induced to patronize US yards by a welter of Government restrictive shipping policies, Government subsidies and other forms of financial assistance.

Most, if not all, US shipbuilding yards also service other markets, in particular, ship conversion and repair, and the construction of off-shore oil drilling platforms and many diversified products. Some yards specialize in this work and most yards compete for it when their shipbuilding markets decline.

We will examine each of these principal markets and the forces which generate the major elements of US shipbuilding demand. At the same time, we will focus on the manner in which these markets contribute to instability in the shipbuilding market.

Naval Shipbuilding

The US Navy shipbuilding program is the principal reason that the worldwide contraction in new orders has not affected US shipbuilders as much as their counterparts in Europe. No other nation in the free world supports a naval shipbuilding program of comparable size and dollar value. Navy business provides a floor when the domestic demand for new commercial shipping is weak. Yet in the past decade, the Navy program has tended to accentuate, rather than dampen, the boom and bust pattern of the commercial market. In the late sixties and early seventies, the Navy market prospects were as bright as its

civilian counterpart. Nuclear attack submarines, nuclear cruisers, Trident submarines, AEGIS ships, destroyers, guided missile frigates, LHAs, surface effect ships and hydrofoil patrol boats were all projected for multiple buys in efficient series construction. In retrospect, only the destroyers and guided missile frigates were procured in the programmed quantities. Nuclear cruisers and hydrofoil patrol boats were procured in token quantities and their programs were then cancelled. The surface effect ship is still an R&D project without much prospect of procurement in the near future. TRIDENT and SSN procurement dwindled to a rate of one each per year. The AEGIS ships were delayed and the program stretched out.

The reasons for the decline in the Navy order book has some ironic elements. It is, for instance, difficult to imagine in light of today's empty order books and vacant building ways, that the principal problem perceived by the Pentagon in the mid-seventies was a scarcity of shipyard capacity sufficient to accomodate the Navy's programs. Nonetheless, it is true that numerous programs were delayed by Pentagon comptrollers in response to real concerns that the industrial base was insufficient to accomplish the Navy's program. There are some examples which illustrate that the view, while not unfounded, was perhaps maintained too long. Repeated attempts over several years to place one submarine tender under contract were frustrated by a lack of responsive bidders. Submarines from the 1974 shipbuilding program are now in early stage of construction at General Dynamic's Electric Boat Division after years in queue. Their scheduled delivery is 1984, 10 years after Congress appropriated the funds. Fearing similar accumulation of unawarded or backlogged orders for tenders and combatants, DOD comptrollers repeatedly slipped requests for these ships.

Most of these delays can be directly related to competition with the then-booming commercial market. Some, however, reflected the deliberate policy of some builders to avoid Navy work in view of the climate of change delays, disruption, and claims which then characterized most Navy work. Many yard owners felt that there was ample, high-profit, commercial work available to fill their ways without exposure to the delays, risks, and aggravation of Navy contract procedures. Time was to prove them wrong.

Whatever the facts, Pentagon comptrollers were convinced that the Navy could not execute its programmed shipbuilding plans on schedule. Consequently, they deferred numerous ships. The deferrals created a bow wave of requirements which continually pile up in out-year budgets. In the closing years of

the Nixon-Ford administration, deferrals, coupled with election-year pressures for strong defense programs, resulted in a 5-year shipbuilding program of 157 ships. The fiscal year 1978 5-year shipbuilding program was greeted enthusiastically by the shipbuilding industry, which was then concerned about the sharp contraction in their commercial orders.

The feeling of security turned to gloom when the Carter administration came into office promising reductions in the defense budget. Even before the Democrats took office, however, the outgoing Republicans unexpectedly requested cancellation of funds for a nuclear carrier and the patrol hydrofoils. Within days after taking office, the new administration further reduced the FY 78 request by two FFG-7s, one SSN-688, and long-lead funding for a nuclear cruiser. Moreover, it announced that changes in the other years of the program were under consideration and a revised 5-year plan would be submitted. After several suspense-filled months, the administration unveiled a 5-year program which, to the surprise of many, was very little changed from those of the previous administration. It called for some 160 new ships. More surprisingly, it restored a modified nuclear cruiser in the FY 79 program, replacing the one removed months earlier.

The shipbuilding industry, which had been expecting a much more austere program, may have breathed the industrial equivalent of a sigh of relief. At the same time in the Pentagon, Navy programmers struggling to put together the Navy's 5-year program for the next cycle were not similarly reassured. The administration's fiscal guidance for the next fiscal year set dollar ceilings for all Navy programs which were sharply lower than those previously provided. There was simply no way to incorporate the large shipbuilding plan within the 5-year program without drastic reductions in fleet operations and maintenance. The alternatives were to lay up active units of the fleet before the end of their projected service life or cut back on ship procurements. Despite their eagerness to preserve the shipbuilding plans, Navy leaders were critically concerned about fleet readiness and force levels. In the face of these competing pressures and dollar constraints, the Navy unenthusiastically forwarded a shipbuilding plan of only 99 ships. The administration made some further modifications and, in March 1978, forwarded its second 5-year plan, this one containing only 70 new ships, a reduction of 90 ships from its predecessor 9 months earlier. Subsequent Navy shipbuilding proposals have suffered from the same basic problem: insufficient funds to operate a stable number of ships and at the same time replace obsolescent units with more capable ones.

A variety of reasons has been advanced for the sharply diminished Navy shipbuilding programs in 1979 and 1980. Two themes have emerged as the administration's rationale for these reductions. First, the contracting for Navy ships was hopelessly entangled in claims and court contests which had to be resolved before sizeable shipbuilding programs could be authorized. Secondly, it was alleged that the Navy failed to articulate its requirements. We contend that both reasons were red herrings.

The shipbuilders' claims were well on the way to resolution in early 1979 and were fully resolved before the end of that year. Contract procedures were in place that shifted the risk of new ship classes from the builders to the Government. There was a new spirit of cooperation between shipbuilders and the Navy. All the major shipyards, even those which previously shunned government contracts, looked to Navy work as the "only game in town." Nonetheless, the heat that had been generated by the decade-long dispute over shipyard claims had left a brand on Navy shipbuilding programs. Because that stigma had been implanted in the political consciousness of the American people, opponents could cite the "claims problem" as supporting rationale for virtually any reduction in shipbuilding.

Navy force requirements in 1979 were clearly articulated by the Chief of Naval Operations and supported by studies and analyses too numerous to mention. Congress and the administration requested and received detailed descriptions for cost tradeoffs and force options.

Navy supporters and opponents alike dissected the studies, extracted the portions which supported their positions, and pointedly ignored the rest. The studies, despite their expense, did not resolve the issues. Furthermore they did not elevate the quality of debate; they did, however, add substantially to the volume of arguments. However well the Navy's case was made, it was not met with a receptive audience in the administration. The reason is best described by Professor Francis J. West, Jr.:

. . . even if the Navy's "act" were put together by Alfred Thayer Mahan, Chester Nimitz, and Arleigh Burke, the funding would not change within the administration. There (was) no perceived clear and present danger. The problem (was) a shortage of money, not of articulate rationale.

Within weeks of the publication of Professor West's opinion (Proceedings of the US Naval Institute, October 1979), the Carter administration unwittingly illustrated the validity of his theory. Frustrated by the scarcity of military options which could respond to the taking of our Embassy staff in Tehran, the administration acknowledged a shortage of sealift. Warships had to be shifted from the 6th and 7th Fleets to establish a military presence in the Indian Ocean, and deployments were extended to maintain this presence. The Russian invasion of Afghanistan strengthened the administration's resolve to redress that imbalance; consequently, the FY 1981 5-year shipbuilding plan reflected a sharply increased Navy shipbuilding program. Unfortunately for the shipbuilding industry, little increase was programmed in the near years when order books are empty. Out-year prospects were brighter—but out-year prospects have a way of disappearing. Consequently, the US shipbuilders have been dealt the double blow of a depression in their commercial shipbuilding markets compounded by a severe contraction in projected Navy business. It remains to be seen how many of the current builders will decide whether future prospects do not justify staying in this highly cyclical business.

US Merchant Marine and Commercial Shipbuilding

The United States has by far the world's largest volume of foreign trade. Despite crude oil price increases and worries over recessions, US imports and exports increase each year. Figure 1 shows US oceanborne foreign trade since 1920. The inflection of the curve indicates US trade will probably continue to rise. Given this growing trade and the statutory requirements that US-flag merchant ships carry a substantial portion of it, one might expect commercial shipping to provide a booming market for US yards. This is not the case.

The lower curve of Figure 1 plots the tonnage of US oceanborne trade carried in US-flag ships. Despite the large volume of US trade, US-flag ships carry only a small percentage (4.1 percent in 1978) of our total oceanborne tonnage. US lines carry this relatively low percentage simply because they are not competitive with foreign lines that pay much less for ships and crews, operate with fewer restrictions and are highly subsidized or state owned. For example, a Filipino crew is paid about one fourth as much as an American crew. (Under current law, all officers and 75 percent of the ratings of ships documented in the United States must be US citizens.) The US Government tries to compensate for these differences through

UNITED STATES OCEANBORNE FOREIGN TRADE AND COMMERCIAL CARGO CARRIED IN US FLAG SHIPS

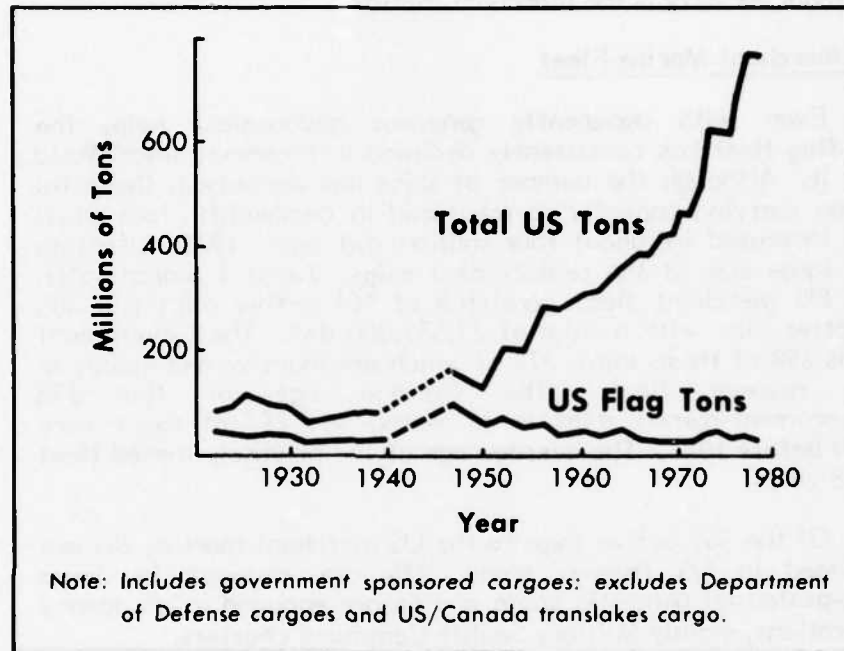


Figure 1.

an extensive program of aid to the maritime industries; other developed maritime nations do the same.

Government Policy and Subsidies

As small as the US commercial shipbuilding program is, it owes its existence to Government policies and subsidies including construction subsidies, mortgage guarantees, tax deferrals on capital construction funds, operating subsidies, and restrictive shipping policies (cabotage and cargo preference) for ships built in US yards.

Some US yards are more competitive than others, but none could compete solely on economic grounds for commercial orders on the world market without Government support. Other countries support their shipping lines and shipbuilders for a variety of economic and national policy reasons. Some

shipbuilding countries, such as Korea, have labor costs which are less than 10 percent of the level prevailing in the US industry. The question for shipbuilding boils down to one of deciding whether the nation should retain the ability to build its own merchant shipping. National security is the ultimate justification on which the question hangs. A key ingredient of national security is the merchant marine.

US Merchant Marine Fleet

Even with apparently generous government help, the US-flag fleet has consistently declined in numbers, since World War II. Although the number of ships has decreased, the total cargo carrying capacity as measured in deadweight tons (dwt) has increased by about four million dwt since 1975 reflecting the large size of the replacement ships. As of 1 March 1980, the US merchant fleet consisted of 561 active ships and 305 inactive ships with a total of 23,559,000 dwt. The Government owns 298 of these ships, 275 of which are inactive and mainly in the reserve fleet. The average age of the 298 Government-owned ships is 33 years, and 267 of them were built before 1946. The average age of the privately owned fleet is 18 years.

Of the 561 active ships in the US merchant marine, 244 are engaged in US foreign trade, 224 are engaged in Jones Act-protected domestic trade and 66 are engaged in US agency operations, mainly Military Sealift Command charters.

An important point about this increases in US cargo carrying capacity is the fact that most of the ships recently constructed are modern, large and high speed intermodal vessels such as containerships, barge carriers and roll-on/roll off (Ro/Ro) ships. The following table summarizes the increase in intermodal ships in the US fleet over the past decade:

TABLE 2

CLASS	1979	1978	1977	1975	1970
Containerships	101	103	102	107	86
Barge Carriers	17	19	23	23	1
Roll-On/Roll-Off	22	16	15	9	4
Total	140	138	140	139	91

The barge carriers (LASH—Lighter Aboard Ship and SEABEES—Sea Barge Carriers) are the most utilitarian for the

military, particularly in areas where developed ports are not available. The Ro/Ro ships are also particularly useful but require at least semideveloped ports. Unfortunately, barge carriers and Ro/Ro ships are not as efficient as the large non-self-sustaining containerships are in commercial trade and, consequently, several barge carriers are being converted into containerships. On the other hand, non self-sustaining containership are not as versatile or as useful for defense purposes as are the other intermodal types, but the Defense Department has several programs to improve their usefulness in military support roles.

The US-flag liner ships are fairly new, modern, and efficient. US shipping lines are generally well managed and some lead the world in innovative techniques; however, returns on investment are basically not commensurate with the investors' risks. Overtonnage in US trades, rate instability, rate wars, illegal rebating, and worsening financial conditions are the facts of life for many US-flag operators. For example, MARAD figures indicate that 21 subsidized US-flag shipping operators reported a total of \$18 million in net losses from shipping operations on combined revenues of \$1.7 billion in 1977.

The ships of the US-flag fleet are owned by many different types of companies including the actual operators (shipping lines), banks, subsidiary corporations of oil companies, commodity manufacturing industries and even individual companies for each ship of a parent corporation (to limit liability). There are about 176 recorded owners of US-flag ships. This large number of owners makes it difficult to project shipbuilding programs.

In addition to the US-flag fleet, US citizens and US companies own ships registered in other countries. This grouping of ships is called the effective US-controlled (EUSC) fleet, the "flag of convenience" fleet or the "runaway fleet." As of 1 January 1979, the US "flag of convenience" fleet consisted of 687 ships with a total of 61,626,000 dwt.

Tankers and bulk carriers make up most of this fleet. Of note is the fact that of the 687 ships in the "flag of convenience" fleet, only 28 were built in the United States. Most of these 28 ships are relatively old and small. At present, US shipyards are not building or planning to build any ships for foreign flag companies.

Building Programs

Future US commercial shipbuilding programs are best described as uncertain and unpromising. High interest rates, high shipbuilding cost, shipping overtonnage, and confused government policy are causing potential ship buyers to hold back. MARAD's most recent commercial shipbuilding forecasts include no large cargo or intermodal ships in 1980 and 1981 and only 3 in 1982. Although the forecast for 1983 and later is better, these later programs will probably not materialize unless there are significant changes. In particular, the dry bulk carriers depend upon specific legislation now in Congress and the LNG (liquefied natural gas) tankers will be built only if environmental and safety questions are put to rest and there is strong support on the part of the Department of Energy and other Government agencies.

In any case, this uncertain and unpromising forecast will have a near term effect on shipyards that are heavily involved in commercial building. Many of these shipyards have in the past and will in the future look more to diversification as both a temporary and permanent fix.

Other Markets

While large private shipyards prefer to build ships as their primary line of work, all shipyards are involved to some degree in a wide variety of other markets. Some of these markets, such as ship repair, are closely related to shipbuilding while other markets, such as building boxcars and bridge sections, are only remotely related. Some of these markets are very profitable while in other cases the shipyard is willing to take a loss on a venture in order to maintain a work force for future shipbuilding work. Some of these markets are insignificant to many of the yards; but, for some shipyards, diversification is a matter of survival.

Ship Repair Overhauls and Conversions

Repair and conversion work in private yards amounted to almost \$1.7 billion in 1979 and employed about one-fourth of the 170,000 US shipyard workers. Private yard repair work is divided almost evenly between commercial ships and naval ships.

As mentioned previously, the eight Government-owned naval shipyards which are manned by Government employees do not build ships but, rather, overhaul the more complex Navy ships. Their yards perform about 70 percent of the Navy's

overhaul and repair work and are the heart of the Nation's mobilization base for naval ship repair.

In the past, private yards have generally overhauled the less complex ships; however, as the ratio of complex to less complex ships increases, the private sector will be tasked to overhaul more of the complex naval warships. At the same time, decreasing shipbuilding workloads are forcing many yards to compete for Navy overhauls. Although naval ship repair and overhaul work is projected to increase slightly over the next 5 years, there will not be enough naval overhauls to keep all the yards at the levels desired--nor does it appear desirable to spread complex overhauls among too many shipyards. After a few bad experiences, the Navy is apparently making an effort to limit this work to private shipyards which have demonstrated the necessary capability.

Commercial ship repair and conversion work is also projected to increase over the next few years for various reasons, including:

- o Repowering of the mostly steam turbine-propelled US merchant fleet with fuel-efficient diesel engines;
- o Converting tankers to meet the safety and environmental standards of the Port and Tanker Safety Act which takes effect in 1981;
- o Supporting the increased sealift being assembled in light of conditions in the Middle East. This includes the probable conversion of SL-7 containerships and the readying of various prepositioning ships;
- o Supporting the increased domestic shipping that is transporting Alaskan oil;
- o Converting and "jumboizing" existing vessels to quickly and economically meet changing shipping demands; and
- o Repairing more foreign ships. Currency exchange rates are helping US shipyards to be more competitive in the world market, in particular in comparison with northern European yards.

It is likely that the repair and overhaul of both commercial and naval vessels will expand through the years ahead. However, this work cannot take up all the excess capacity that will be generated by the projected decline in shipbuilding; ship repair should not be considered as a substitute for shipbuilding programs.

US Coast Guard

The Coast Guard should provide a growing market for the US shipbuilding industry. To meet their varied and increasing roles the Coast Guard has a fleet of 246 cutters, down from 339 in 1969. More than 60 of these cutters are 35 to 40 years old, 18 are 40 to 45 years old and 2 are 50 to 55 years old. Obviously, the increased demands on the Coast Guard call for the building of additional cutters and other vessels.

The Coast Guard has commenced a program to build a new class of 13 to 26 very modern 270-foot medium-endurance cutters. Four are under construction and nine others are authorized on a multi-year contract basis over the next 3 years. This multi-year contracting strategy, which provides a stable building program as well as a standardized ship, is similar to the Navy's procurement strategy for the USS Spruance (DD 963) class ships. Even with this procurement plan, in 10 years 150 Coast Guard cutters will be over 20 years old requiring either block replacement or major service-life extension programs. Clearly, even this three cutter per year building program is insufficient to satisfy growing Coast Guard requirements.

Foreign Military Sales

Foreign military sales under the Defense Security Assistance Program have in the past provided, and will probably continue to provide, only a small portion of the total shipbuilding industry market. With the cancellation of the Iranian contract for four destroyers with a face value of \$725 million, the remaining contracts amount to less than \$600 million with the three Australian Guided Missile Frigates (FFG) on order from Todd Seattle accounting for \$418 million of this total.

Offshore Industries

US shipyards are world leaders in the design and construction of offshore mobile drilling platforms and support craft and the other equipment required to find and produce

undersea oil and gas. There is now a 9.5 percent import duty on foreign-built offshore drilling and production platforms intended for use on the outer continental shelf of the United States.

Rising OPEC oil prices, unstable conditions in the Middle East, the deregulation of new oil in the United States, and other factors have increased the demand for oil rigs. As of 31 December 1979, 35 mobile offshore drilling rigs worth about \$1 billion were under contract in US shipyards. In the main, these rigs are being built by yards specializing in their construction, such as Marathon Le Toumeau of Vicksburg, Mississippi, and Bethlehem Steel of Beaumont, Texas. However, Ingalls Shipbuilding of Pascagoula recently received orders for two jack-up rigs and the Bethlehem Steel Sparrows Point yard is building huge drill-platform mats and also has contracts for two jack-up rigs.

How much this market continues to increase will depend upon federal and state leasing and energy-environmental decisions, exploration results, and competition by foreign builders. By all indications, the offshore oil and gas industry will continue to provide a substantial and increasing market.

Floating ocean thermal energy conversion (OTEC) power plants and deep seabed mining ships are touted as potential markets. Both programs hold promise; however, time and funds are required to resolve the technical problems facing OTEC and the initiation of deep seabed mining is still tied up in the United Nations Law of the Sea Conference, ongoing since the early seventies. It is doubtful whether these programs will provide an appreciable market for the shipbuilding industry within at least the next 5 years.

Industrial Products

With the wide range of skills and manufacturing facilities available in most yards, it is logical that shipyards would have industrial product lines. Products, of course, include components for ships being built by both the parent company and other yards; however, products are by no means limited to ship components. At least three shipyards are building railroad freight cars. Others are building and even installing large steel structures such as steel bridge sections and nuclear power plant enclosure systems. Other nonship components being built include navigation buoys, oil refinery vessels, components for nuclear power generating plants, large vacuum chambers, and machinery foundations.

Since this work varies with the state of the economy and the shipwork available for the yard, it is difficult to predict future markets. However, it is clear that the importance of this type of work will increase, particularly if shipbuilding or ship repair work is not available.

In summary, although diversification is a way of life for most shipyards, it does distract from the primary business of building ships. As shipyards find lucrative, diversified markets, and retrain their people for these markets, it may be difficult to shift back to shipwork if the need arises.

THE SEARCH FOR A GOVERNMENT POLICY

In the past decade Washington has seen two major "blue ribbon" efforts to review maritime policy as it relates to the shipbuilding industry. The first, Commission on American Shipbuilding, was directed by Congress in the Merchant Marine Act of 1970. Its specific task was to determine whether the American shipbuilders could lower their production costs relative to their primary foreign competition to permit a reduction in construction differential subsidy (CDS) payments from the allowed maximum of 50 percent to 35 percent of US cost. If the Commission found that it was not possible to reduce CDS to 35 percent, it was charged to recommend an alternative to the CDS program.

The Commission produced a definitive three-volume study of the US commercial shipbuilding industry and estimated that CDS could be reduced to 35 percent. This conclusion, reached during the peak years of the shipbuilding boom, was understandable but wrong. In fairness to the Commission, its conclusion was to some extent predicated on enactment of the Commission's other principal recommendation: an extension of cargo preference to cover importation of all fuel from foreign sources by waterborne transportation. A bill to implement this recommendation provoked a major battle between the primary shipping and shipbuilding interests and the major oil companies before it was defeated in 1977.

The defeat of the cargo preference legislation left the Carter administration without a maritime policy but with a maritime industry much in need of one. With two subsidized liner companies entering receivership, and with the shipbuilding industry suffering a sharp drop in business activity, the Nation clearly needed to reexamine its maritime goals and programs. The vehicle chosen for this examination was a White House-directed interagency task force with representation from

every Government agency with an interest in maritime policy. The variety of interests and viewpoints represented in the task force proved to be its undoing.

The interagency group was forced to address a collection of issues which individually provoke strong responses in the government agencies--free trade vs. protectionism, open competition vs. cartelization, commercial interests vs. defense interests, and so on. In view of the contentiousness of these issues, it is not surprising that no consensus could be reached. After a year of effort, the task force dissolved without submitting a report. Draft working papers were ordered destroyed. In lieu of a report, the President sent a seven-page policy letter to the Chairman of the House Merchant Marine and Fisheries Committee.

The letter, signed in 1979, embraced the status quo with a few differences. Among the recommendations were broadened antitrust waivers for shippers involved in rate-setting conferences-as well as proposed legislation to encourage building of bulk carriers. The key recommendation did not change the prospects for domestic shipbuilding in any dramatic way. Construction differential subsidies were endorsed as was the existing cargo preference legislation.

US shipbuilders and flag shippers had high hopes that bilateral trade agreements would be endorsed. The Shipbuilders Council and other trade groups had been supporting cargo sharing agreements which would guarantee that a fixed proportion of US trade with a specific trading partner would be reserved to the flag carriers of the two nations and the balance would be open to third-nation flags. A typical arrangement would provide a 40 percent share for the US flags, 40 percent for the trading partner, and 20 percent for third-nation flag carriers. A provision of this type would have increased the US carriage from 5 percent of US foreign trade to something approaching 40 percent if the United States executed agreements with all its major trading partners.

In his letter the President condemned cargo sharing agreements as an impediment to free trade which could work against our interests in competing for the cargo of other trading, third-flag nations. The primary concern was probably diplomatic since the cross-trading, third-flag nations, who are among our closest allies, would be hurt by these arrangements.

President Carter's policy letter was viewed by many as unlikely to alter the decline in US-flag lines or in the US

shipyards. His final paragraph urged American traders to use US flags, and US shippers to "consider" American shipyards. For the shipbuilding community, these words were scant comfort.

Omnibus Maritime Bill

Eight days before the President signed his policy letter, Congressman John M. Murphy (NY), Chairman of the House Committee on Merchant Marine and Fisheries, cosponsored a bill with Congressmen Gene Snyder (KY) and Paul N. McCloskey, Jr. (CA), which bore the alliterative title "Omnibus Maritime Regulatory, Reform, Revitalization and Reorganization Act of 1979" (HR 4769). Unlike the presidential policy letter, the Omnibus bill proposed some radical departures from the existing maritime policy. The goal of the bill was clearly stated: to carry not less than 40 percent of the foreign commerce of the United States in US-flag shipping. The primary means which the act endorsed to attain this goal was the negotiation of bilateral cargo sharing agreements with foreign trading nations. The 40-percent policy objective would require an additional 800 US-flag ships engaged in foreign trade. To attract that many new ships to the US trade, HR 4769 proposed a series of key incentives including:

- o Payment of operating differential subsidies (ODS) to foreign-built ships operating under the US flag;
- o Elimination of the condition that only ships on "essential trade routes" were eligible for ODS;
- o Expansion of ODS eligibility to include US ships carrying cargo between foreign countries (cross trading);
- o Extension of antitrust exemptions for rate fixing shipping conferences and associated shippers;
- o Acceleration of tax write-offs through depreciation.

In essence, the Omnibus Maritime Bill was designed to expand greatly the size of the US-flag merchant fleet, but at some initial expense to US shipbuilders. The provision to pay operating differential subsidies for foreign-built ships sailing under the US-flag would sever the cords which bound the subsidized lines to US shipbuilders. Freed from the requirement to buy American-made ships, the shipping lines could pursue the best price and delivery schedule available in the world market.

This provision has long been sought by the unsubsidized shipping lines who had been buying their ships overseas right along. These same ship operators would be the principal beneficiaries of the elimination of the "essential trade route" requirement. The maritime unions, who would benefit from the increase in jobs associated with the expanded flag fleet, were expected to be a major supporter of these provisions. Because it appealed so strongly to some segments of the maritime industry, the proposed Omnibus bill was a potential wedge through the middle of the maritime interest groups which would isolate the shipbuilders from their politically powerful colleagues.

The Omnibus bill did propose the use of both CDS and penalties to foster efficiency and also series production in US shipyards to enhance competitiveness with overseas builders. It also would direct the Secretary of Commerce and the Secretary of Defense to determine how many shipyards are necessary for national security and to take the steps required to maintain the shipbuilding base. It did not, however, state how this is to be done.

In its original form, the Omnibus bill offered the shipyards little realistic hope of any additional business. At worst, the Omnibus bill threatened elimination of that portion of the current workload which is underwritten by the construction differential subsidy. Over the past decade, CDS has accounted for as much as 21 percent of shipyard production employment although in recent years it has been as low as 8 percent. An average over the period was about 14 percent of employment. The Shipbuilders Council claimed knowledge of some 14 ships which would shift from domestic build to foreign build under the Omnibus bill if it were enacted as originally written. The Omnibus bill would in this case speed the elimination of firms in the industry.

In the process of the markup, the shipbuilders successfully lobbied to incorporate a number of provisions which protected their long term interests. To the "foreign build" measure they attached a provision obligating MARAD to certify that there was sufficient work to maintain the "defense mobilization base" before authorizing any foreign build. They also added a requirement that shipowners commit to build one ship in the United States for each ship they built abroad and operated under subsidy in the United States. In addition, the revised bill required that when the foreign-built ship was retired, it would be replaced with US-built tonnage. Also, the period for depreciation of a US-built ship was set at 5 years as opposed to 10 years for foreign built vessels in order to increase the advantage of building in the United States.

The incorporation of provisions favorable to shipbuilders provoked the ire of some of the owners and operators who saw advantages in being able to tap lower-cost foreign markets and still get operating subsidies. However, the owners and operators were too busy fighting among themselves over conference rules and access to US domestic trade, which by the Jones Act of 1920 may only be carried in US-built ships, to post a successful opposition to the shipbuilders' initiative. Eventually the alliances which had supported the Omnibus bill broke down in a series of internecine disputes. Domestic bulk operators were bickering with foreign-trade bulk operators; subsidized liner operators were fighting with the unsubsidized operators. The unions were the most vocal in their opposition because of a provision that would place MARAD in an oversight role over union contractors. The bill that was to solve all the problems of the maritime industry ended up without any significant support in the industry. Only the Shipbuilders Council gave its blessing to the bill and only then if the tax shelter provisions of Title IV were incorporated. However, with the Treasury in firm opposition, Title IV seemed doomed. The competitive processes pulling the maritime coalition apart proved far stronger than the perceived common benefits. At this point the Omnibus bill appears to be dead. Congress's attempt to put together a comprehensive maritime policy seems destined to the same fate as the interagency effort which preceded it.

CONCLUSIONS

There is little reason for optimism about US commercial shipbuilding in the 1980s. The massive investments in new shipbuilding technology during the late sixties and early seventies have failed to reduce the long building times in the United States or to offset high US labor costs. While the gaps in labor costs between US, European, and Japanese yards have narrowed, the yards in the lesser developed nations are now the most efficient producers of less sophisticated shipping. The LNG market for US-built LNG tankers is dormant and, given the environmental concerns and the prospect of pipeline gas from Mexico, it is likely to remain so. The edge which we possessed in this technology is being eroded by new emphasis on LNG tanker construction in Japan and Korea. Supertanker orders will be nonexistent for several years. Great Lakes bulk ships will be the primary new construction commercial market over the next 5 years. Most of the US-flag oceangoing dry bulk ships soon will require replacement and it is possible that inducements could attract this business to US shipbuilders. On balance, MARAD projects new commercial shipbuilding orders

to range from 8 to 12 per year over the next 5 years. This is likely to prove optimistic.

The prospects for change in Government policy favorable to the maritime industry are not bright. The administration's attitude toward bilateral trade agreements will probably spell the doom of any effort to use that device to increase US-flag shipping. Treasury's opposition to off-budget subsidies for the shipowners through the tax mechanism will probably prevail. Expanded "cargo preference" legislation is unlikely to be successfully resurrected. Moreover, if the Omnibus Maritime Bill experience is an accurate reflection of congressional attitudes, it seems unlikely that any major policy initiatives supportive of US shipbuilders will survive the congressional process.

The heightened world tension following the crises in Iran and the Soviet invasion of Afghanistan stimulated support for a larger defense budget. The Carter administration increased the Navy 5-year shipbuilding plans by about 30 ships, 14 of which are the mobilization ships. Yet, this is still less than two-thirds the number of ships in the 1978 5-year plans. Moreover, these plans lack credibility with the Congress, the Navy, and the industry because the building profile follows a familiar pattern: it is lean in the near years and fat in the out years. In the past, such plans have been realized in the near years and ignored in the out years. It is altogether likely that the immutable pressures on the Navy's budget will once again force reductions in these plans. Finally, no currently contemplated Navy shipbuilding plan can fully employ the Nation's present shipbuilding base without a complementary commercial ship program.

Barring a drastic change in the Government's attitude toward bilateral trade agreements or cargo preference legislation, or an equally drastic change in its willingness to support a broadly increased Navy building plan, what lies ahead for the American shipbuilding industry? The leading shipbuilding nations provide instructive, if discomfiting, analogies.

The Japanese government, facing a similar situation, mandated a reduction of 35 percent of capacity. Similar changes have taken place in the Netherlands and in Sweden. What is the likelihood that the United States would follow their example? What would be the outcome? Conventional economic theory holds that the mechanisms of the marketplace reward efficiency with profitability and punish inefficiency with bankruptcy.

It would be comforting to view the current contraction in the shipbuilding market as a period of catharsis for the industry; a period when efficient producers could consolidate their market positions and the inefficient producers would pursue other opportunities. In theory, this would leave a more efficient industrial capacity appropriately sized to the market. In practice, however, the political externalities of shipbuilding cause it to be "protected" from market forces. Politicians cannot view the closure of yards in their districts with the detachment that places economic efficiency above jobs for their constituents. We have already seen these pressures at work in the Congress where deals have been cut to allocate the Navy shipbuilding program to keep yards open, even though operating at the inefficient end of their spectrum. The nation pays a price for this regional protectionism in terms of higher prices for the products it procures. It also penalizes the more efficient producers by denying them orders which they could fill at lower cost. This practice preserves the greatest number of jobs in the industry but higher proportions of the workers are essentially overhead personnel; efficiency suffers.

The magnitude of the problem at this time suggests that allocation will not be an adequate solution. Some yards may gain a temporary respite through political action but some closures appear inevitable. The problem facing the Nation is to maintain a shipwork industrial base that is responsive to security needs during and after a major adjustment in the supply base. Otherwise the disparity between the demand for facilities and capacity will be resolved by market forces. It is the responsibility of the Federal Government to insure an outcome that provides the minimum mobilization functions required for the Nation's defense.

To reach this goal will involve subordination of some of the interests of various Government agencies: a consensus solution satisfactory to all Government elements is no more likely than one wholly satisfying to all elements of the maritime industry. Courageous decisions that focus on the goal of maintaining an efficient and responsive defense base are required. It remains to be seen whether any such decisions can be reached given the inevitable tendency of the bureaucracy, the administration, and the Congress to suboptimize and avoid hard decisions.

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