United States General Accounting Office

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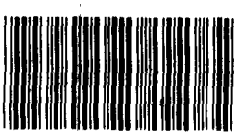
Report to the Chairman, Subcommittee on Defense, Committee on Appropriations, House of Representatives

October 1990

NAVY CONTRACTING

Ship Construction Contracts Could Cost Billions Over Initial Target Costs



GAO/NSIAD-91-18

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United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-228619

October 5, 1990

The Honorable John P. Murtha
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

As the former chairman requested, we have been monitoring cost growth on Navy ship construction contracts. Over the past few years, we have testified and issued several reports on this subject (see p. 28 for a list of our prior products). This report, in addition to updating the status of cost growth, describes the reasons for cost growth and the future budget implications of cost growth.

Background

The Navy relies on commercial shipyards for accomplishing its ship construction. The U.S. government, especially the Navy, is the shipbuilding industry's primary market. Currently, the work is performed under three types of fixed-price contracts—fixed-price incentive contracts with an escalation clause, fixed-price contracts with an escalation clause, and firm fixed-price contracts. Fixed-price incentive contracts contain provisions for the shipyards and the Navy to share the costs above the target cost up to the ceiling price; any amounts above the ceiling are to be borne entirely by the shipyards. Fixed-price incentive contracts, as well as fixed-price contracts with an escalation clause, leave some contingencies open, such as price changes on certain materials or labor costs, and allow the final prices to be adjusted in terms of contingencies. Firm fixed-price contracts, with few exceptions such as contract changes, allow no price adjustments. The type of contract selected depends on the degree of risk involved in building a ship. The Navy also can be liable for additional ship construction costs that arise from requests for contract adjustments and claims against the government. A request for a contract adjustment can be for an additional payment, extension of a ship delivery schedule, or both. If requests for contract adjustments cannot be settled by agreement, shipyards may file claims against the Navy.

Appendix I provides some background information on ship construction contracting.

Results in Brief

As of the beginning of fiscal year 1990, the estimated cost of the Navy's open shipbuilding and conversion fixed-price contracts had increased $5.5 billion over the initial target cost. The Navy has already agreed to pay $1.5 billion for contract change orders, contract adjustments, and claims on these contracts, and it may need another $1.7 billion to pay for its share of projected contract cost overruns and potential contract adjustments and claims. The shipyards may need to pay the balance ($2.3 billion) for their share of the potential cost growth. In addition, many of the contracts are less than 50 percent complete; thus, the likelihood exists that contract cost growth will increase.

The reasons for this cost growth are many and varied. Contract cost overruns, according to shipyard and Navy officials, often result from low bids for Navy shipbuilding contracts that historically have experienced program changes and increased costs. Contract adjustments and claims also contribute to increased costs.

Due to Navy budgeting procedures and practices and redistribution authority, the Navy currently has funds in its shipbuilding and conversion account to cover its share of the cost growth. However, some contract implementation practices for contracts experiencing cost overruns, as well as some adjustment and claim trends, may have future cost implications for the Navy.

Ship Construction Cost Growth

We reviewed the Navy's open shipbuilding and conversion fixed-price contracts—44 fixed-price incentive with an escalation clause, 9 fixed-price with an escalation clause, and 9 firm fixed-price contracts. To measure cost overruns, we used as a base the initial target costs for the fixed-price incentive contracts and the initial contract prices for the other types of contracts. For the 62 contracts, these totaled $27.3 billion. However, this amount could increase by almost $5 billion because of nearly $1.4 billion in contract change orders and nearly $3.6 billion in revised completion cost estimates. In addition to the possible increases due to change orders and completion cost estimates, the Navy has already paid $182 million and is potentially liable for up to $368 million on the remaining open contract adjustment requests and claims, which could raise cost growth another $550 million—to an estimated total of $5.5 billion. (See app. II for a detailed discussion of cost growth.)

Cost growth will likely continue because past experience indicates that costs tend to increase as shipbuilding contracts neared completion and because many contracts are still less than 50 percent complete. A

schedule showing the current projected cost overrun for each of the ship construction contracts and other data is provided in a restricted supplement to this report.

Reasons for Cost Growth

Shipyard and Navy officials attributed cost overruns primarily to low initial prices due to intense competition for Navy contracts. According to these officials, the shipyards submitted low bids to obtain Navy contracts. Shipyard officials said that they were bidding low because of the current market environment in which the Navy is virtually their only customer. Other reasons for cost overruns include problems with ship designs and with late government-furnished equipment deliveries or installations, changes to original contracts, and unrealized gains in productivity as a vessel or a class of vessels moves through construction. Increases in contract costs also result from contract adjustments and claims when shipyards incur expenses they believe were caused by the Navy and were not covered by the contracts. (See app. III for a detailed discussion of the reasons for cost growth.)

Budgeting for Cost Growth

We found that contract cost growth was being covered from the difference between the Navy's ship construction appropriations and the ships' construction contract prices. For example, initial appropriated ship construction funds, totaling $23 billion for 46 selected ship construction contracts, exceeded the total initial contract price of $21.2 billion by $1.8 billion, or 8.5 percent. Following congressional guidance, the Department of Defense and the Navy routinely redistribute appropriate funds to cover funding deficiencies, including ship construction cost growth, through transfer authorizations and reprogramming actions. (See app. IV for a detailed discussion of the future budget implications of cost growth.)

Navy officials said that they do not foresee any major problems in covering the Navy's current share of the forecast cost growth. However, we observed some contract implementation practices for contracts experiencing cost overruns and noted some adjustment and claim trends that may have future cost implications for the Navy.

We did not obtain official agency comments. However, Navy officials reviewed a draft of this report, and we have incorporated their comments as appropriate.

Our scope and methodology for the review are provided in appendix V.

We are sending copies of this report to the Chairmen, Senate Committees on Governmental Affairs and on Appropriations, House Committee on Government Operations, and Senate and House Committees on Armed Services; the Director, Office of Management and Budget; and the Secretaries of Defense and the Navy. Copies will also be made available to others upon request.

Please contact me at (202) 275-6504 if you or your staff have any questions concerning this report. Other major contributors to this report are listed in appendix VI.

Sincerely yours,

Martin M Ferber
Director, Navy Issues

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Abbreviations

FFP	firm fixed-price
FP-E	fixed-price with escalation
FPI	fixed-price incentive with escalation

Ship Construction Contracting

All new construction of naval vessels is accomplished by commercial shipyards. During the 1980s, private shipyards administered a Navy ship construction program that averaged over $10 billion a year. With this level of construction, the Navy fleet has grown from 479 ships in fiscal year 1980 to 566 at the start of fiscal year 1990.

Ship Construction Acquisition Environment

In the 1980s, the Secretary of the Navy increased the reliance on the competitive process in the award of contracts. According to the Navy, this has resulted in favorable ship construction awards. For example, the Navy's Office of the Competition Advocate General stated in a 1986 report that 95 percent of ship construction placed under contract in fiscal year 1986 was awarded competitively. This competition, according to the Navy, would generate $958 million in savings when compared to past sole-source negotiated contracts. In later reports, the Navy cited additional potential savings due to competition.

According to the President of the Shipbuilders Council of America, Navy shipbuilding savings have been attained because competition for Navy ship construction has become increasingly aggressive, and accordingly, shipyards are pricing work close to their break-even points. According to the council's president, this has occurred because the U.S. shipbuilding industry is currently experiencing one of the most financially vulnerable periods of its financial existence. Part of this vulnerability has been created because the shipbuilding industry has virtually no other market to pursue other than that of the U.S. government, principally the Navy.

The council's president said that the collapse of U.S. commercial shipbuilding was caused by the executive branch's 1981 decision to terminate subsidies for merchant shipbuilding. The termination of those subsidies increased U.S. shipbuilding prices, thus, in effect, transferring commercial shipbuilding work to Europe, Japan, and South Korea where shipyards continue to receive subsidies.

Shipbuilding and Conversion Contracts

For ship construction, the Navy uses various fixed-price contracts. It primarily uses fixed-price incentive (FPI) contracts with an economic price adjustment, allowing for compensation adjustments for material and/or labor price escalation. An FPI contract has a negotiated target cost, a target profit, a ceiling price, and a cost share formula for costs above the target cost up to the ceiling price. Material and labor compensation adjustments are not a part of the FPI target or ceiling price

amounts; such amounts are paid outside the incentive price computations. Generally, the ceiling price is 125 to 145 percent of the target price. The cost incurred over the target cost is a cost overrun[1] that is shared, usually equally, by shipyards and the Navy until the ceiling price is reached. The ceiling price is the maximum amount the Navy will pay, regardless of a shipyard's actual cost experience. This type of contract allows financial risk to be shared by a shipbuilder and the Navy.

The Navy uses two other types of fixed-price contracts—fixed-price with an economic price adjustment or escalation clause (FP-E) and firm fixed-price (FFP). An FP-E contract also leaves some contingencies open, such as price changes on certain materials or labor costs, and allows the contract price to be adjusted for these contingencies. An FFP contract stipulates a firm price allowing few exceptions, such as contract changes, and no price adjustments to be made to the original work after the contract has been awarded.

The type of contract the Navy selects depends on the degree of risk involved in building a ship. If the risk is too much for an FFP arrangement, a shipyard may be willing to take an FP-E contract, which leaves the price open on certain items. If the risk is calculable to a reasonable degree, a shipyard may be willing to take an FPI contract.

Contract Adjustments and Claims

On ship construction contracts, the Navy also can be liable for additional ship construction costs that arise from requests for contract adjustments and claims. A request for contract adjustment can be for an additional payment, an extension of a delivery schedule, or both, which a shipyard requests and is not in dispute when the Navy receives it. Whenever such requests cannot be settled by agreement, shipyards may file claims against the Navy.

To facilitate the resolution of requests for contract adjustments, the Navy has established a claims avoidance program. Under the program, Navy personnel are assigned to each ship being built to monitor construction. They monitor such items as noncompliance with contract terms, differences in interpretation of contract provisions, and changes in the method or sequence of work. An important aspect of this program

[1]The term for costs over current target costs is "cost overruns." Navy officials, however, have said that this term is somewhat misleading because Navy acquisition executives expect costs to exceed targets and because the Navy has testified to the Congress that it has sufficient funds to cover projected costs.

is maintaining a documented record of significant events occurring during the administration of each contract that may lead to a future claim.

Forecast Cost Growth on Navy Shipbuilding Contracts

We reviewed the Navy's open shipbuilding and conversion fixed-price contracts—44 FPI, 9 FP-E, and 9 FFP—and found that as of September 1989, about $2.3 billion may be needed by the shipyards and about $1.7 billion by the Navy to pay for forecast cost growth (projected contract cost overruns less underruns plus potential contract adjustments and claims). This $4 billion for forecast cost growth is in addition to the $1.5 billion the Navy has agreed to pay the shipyards for contract change orders, contract adjustments, and claims and involves (1) a net projected contract cost overrun (overruns less underruns) of about $3.6 billion and (2) a potential, additional liability for contract adjustments and claims of up to about $0.4 billion.

A schedule showing the projected cost overrun for each of the ship construction contracts that we reviewed and other cost data is provided in a restricted supplement to this report.

Cost Overruns

The Navy can increase the initial contract amount on ship construction contracts for approved changes by using funds that are a part of its ship construction budget. For the 62 contracts reviewed, the total of the FPI contracts' initial target costs and the FP-E and FFP contracts' initial contract prices was $27,276.9 million. This initial amount, as shown in table II.1, has increased to $28,643.2 million because of Navy contract change orders, yielding an initial ship construction cost increase of $1,366.3 million.

Table II.1: Ship Construction Contract Cost Increase From Initial to Current Amount (Dollars in millions)

Contract type	Target cost/contract price		Cost increase
	Initial	Current	
FPI	$24,279.1	$25,126.3	$847.2
FP-E	1,502.2	1,667.7	165.5
FFP	1,495.6	1,849.2	353.6
Total	**$27,276.9**	**$28,643.2**	**$1,366.3**

For an FPI contract, the estimated cost over the current target cost up to the ceiling price is a projected cost overrun and represents an additional liability that, generally, is shared equally by the concerned shipyard and the Navy; the cost over the ceiling price is a shipyard's liability. For an FP-E or FFP contract, the cost incurred over the current contract price is a shipyard's liability.

The total estimated completion cost for the contracts reviewed is $32,196.5 million. On the basis of this estimated completion cost, we estimate the total projected cost overrun to be $3,784.1 million on 24 contracts. Of the remaining contracts, 6 are projected to underrun their completion costs by a total of $230.8 million, and 32 are projected to be completed at their estimated completion costs. As shown in table II.2, the net projected cost overrun is $3,553.3 million.

Table II.2: Ship Construction Projected Cost Overruns Less Underruns

Dollars in millions

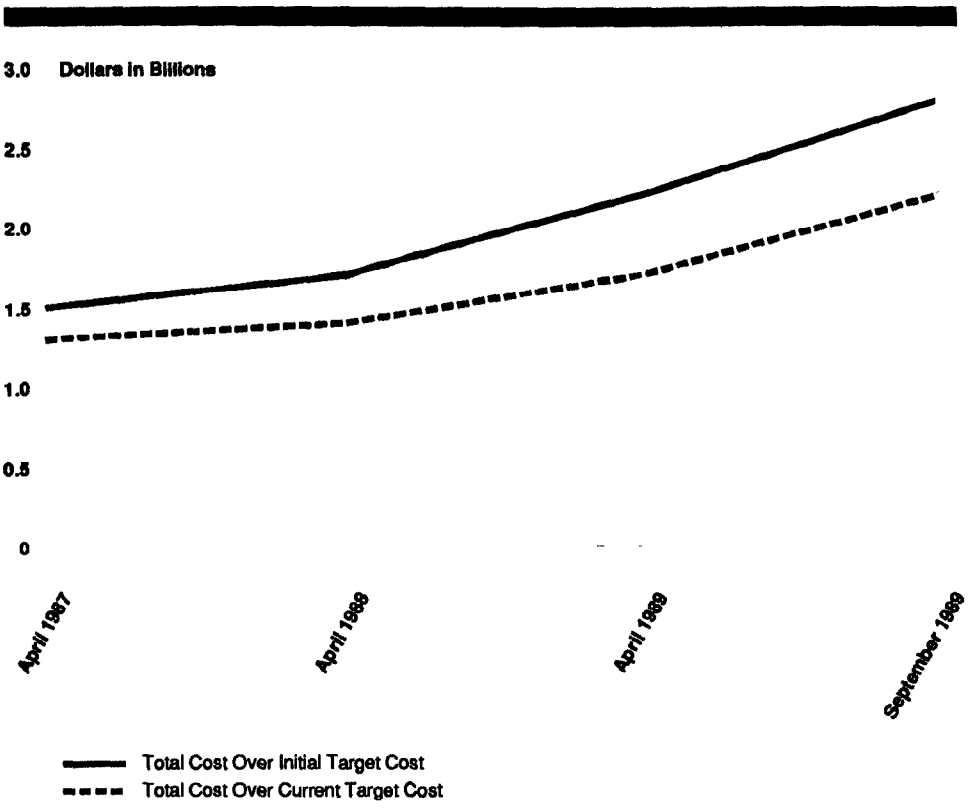
	Overrun		Underrun			
Contract type	**Amount**	**Number**	**Amount**	**Number**	**No change**	**Net overrun**
FPI	$3,784.1	24	$230.8	6	14	$3,553.3
FP-E[a]	0.0	0	0.0	0	9	0.0
FFP[a]	0.0	0	0.0	0	9	0.0
Total	**$3,784.1**	**24**	**$230.8**	**6**	**32**	**$3,553.3**

[a]On this type of contract, the Navy has no liability in regard to shipyard cost overruns/underruns.

These overruns include $964.3 million in costs above ceiling prices, which are a shipyard's liability. The shipyards and the Navy are each potentially liable for about one half of the remaining $2,589 million (costs between the target costs and ceiling prices), or about $1,294.5 million each. The attack submarine program accounts for nearly 60 percent of the projected cost overruns.

Our analysis of contract costs indicates that costs over target costs on FPI contracts tend to increase as the contracts age. We found that of the 22 FPI contracts that we reviewed in April 1987, the 18 that remained open as FPI contracts were experiencing even greater cost overruns in September 1989 than in 1987. As shown in figure II.1, the total projected net completion cost over current target cost on these 18 contracts increased (1) $100 million from April 1987 to April 1988, (2) $300 million from April 1988 to March 1989, and (3) $500 million from March 1989 to September 1989—a total net increase of $900 million, or 69 percent.

Figure II.1: Net Contract Cost Growth Over Target Costs for Originally Reviewed Contracts



Also, as shown in figure II.1, the total net cost increase over the initial target costs on these 18 contracts increased $1,300 million, or 87 percent between April 1987 and September 1989.

Many of the estimated completion costs on the 44 FPI contracts we reviewed this time (which included the original 18) were near or above their ceiling prices. Currently, 16 of these FPI contracts, or 36 percent, have estimated completion costs ranging from 90 to 150 percent of their ceiling prices—10 contracts, or 23 percent, are above ceiling prices. One half of the 44 FPI contracts are under 50 percent complete. Thus, the likelihood exists that the estimated completion costs, and accordingly, the cost overruns on these contracts will increase.

Adjustments and Claims

On ship construction contracts, shipyards can attempt to recoup incurred expenses that are not covered by contractual agreement through requests for contract adjustments and claims. For the contracts

we reviewed, 82 contract adjustments and claims, totaling $689.3 million, had been submitted on 27 contracts, as shown in table II.3.

Table II.3: Ship Construction Contract Adjustments and Claims

Dollars in millions

Contract type	Number of contracts	Contract Adjustments Number	Contract Adjustments Amount	Contract Claims Number	Contract Claims Amount	Total adjustments and claims Number	Total adjustments and claims Amount
FPI	16	31	$515.1	10	$33.8	41	$548.9
FP-E	7	23	105.8	3	0.9	26	106.7
FFP	4	15	33.7	0	0.0	15	33.7
Total	**27**	**69**	**$654.6**	**13**	**$34.7**	**82**	**$689.3**

The attack submarine program accounts for 50 percent of the total amount that the shipyards sought.

The Navy has already settled 44 of the contract adjustments and claims, totaling $321.4 million, for $181.9 million. In one large settlement, General Dynamics Corporation, Electric Boat Division submitted two requests for contract adjustments on two of its contracts for attack submarines. These requests were submitted to recover $109.4 million in expenses that were not covered by the contracts and were resolved in April 1988 for $82.4 million.

The Navy has denied $139.5 million on the 44 requests for contract adjustments and claims because of time limitations or inadequate justifications. Rejected contract adjustments and claims may be resubmitted by the shipyards through the contract change or litigation process. On the other 38 contract adjustments and claims that are pending, the Navy is potentially liable for up to $367.9 million.

We observed that as ship construction cost overruns increased, so did contract adjustment and claim amounts. For example, in August 1989, we reported[1] that on 24 of the Navy's open FPI ship construction contracts, the shipyards had submitted $213.7 million in contract adjustments and claims as of March 1989. During this review, we found that the Navy's potential liability had increased to $535.5 million on these same contracts as of September 1989, or over 150 percent, during these 6 months.

[1] Navy Contracting: Status of Cost Growth and Claims on Shipbuilding Contracts (GAO/NSIAD-89-189, Aug. 4, 1989).

Reasons for Cost Growth

The reasons for contract cost growth are many and varied. They include intense competition for Navy contracts, problems with ship design changes, problems with government-furnished equipment installations, changes to contracts, low productivity of shipyards, and the type of contract used for a lead ship. Increases in contract costs also result from adjustments and claims.

Intense Competition for Navy Contracts

In our 1987 report,[1] we stated that, according to shipyard and Navy officials, shipyards submitted low bids to obtain Navy contracts. Our interviews with shipyard officials, at that time, confirmed that the shipbuilding industry was competing in a close to the margin environment on Navy ship construction contracts because of a decline in commercial shipbuilding work.

During this review, we found that the same market environment existed and that the shipyards were continuing to submit low bids to win Navy shipbuilding contracts, as illustrated by the following examples.

- According to Navy officials, Ingalls Shipbuilding, Inc., wanted to build amphibious assault ships. Consequently, to obtain a 1986 contract to build three follow-on assault ships, its average bid was only 42 percent of the bid to build the first ship. An Ingalls official said that to maintain the shipyard's work load, it had to bid low. Currently, the Navy is projecting a cost overrun on this contract.
- Newport News Shipbuilding's best performance for building attack submarines was for the SSN-721 under a 1981 contract. However, Newport News' later bids on three additional contracts to build a total of 11 more attack submarines were based on an average of about 25 percent fewer labor hours per submarine. These three contracts are currently projected to overrun, and they are near or above their current ceiling prices.

Shipyard officials said that the current shipbuilding environment in which the Navy is virtually their only customer has forced them to bid lower than normal to obtain Navy contracts.

[1] Navy Contracting: Cost Overruns and Claims Potential on Navy Shipbuilding Contracts (GAO/NSIAD-88-15, Oct. 16, 1987).

Problems With Ship Design Changes

The Navy seeks to improve its ships through design changes. During ongoing ship construction, however, such improvements have resulted in construction delays and consequently have increased construction costs.

For example, according to a Navy official, Navy-initiated changes for a new vertical launch system and for an upgrade to an anti-air warfare system caused major construction problems that delayed Bath Iron Works Corporation's construction of guided-missile cruisers. The official said that 1,300 of the 2,200 ship drawings had to be revised because of design changes and, in effect, were totally new drawings. These new drawings were not covered by the original contract. Thus, construction costs increased.

In another instance, the Navy decided to install retractable bow planes on attack submarines being constructed by the Electric Boat Division to allow the submarines to break through ice. Because of the heat generated from welding in areas adjacent to the bow plane location, some other work on the submarines could not be completed before the scheduled launch date. This work was completed subsequent to construction, which resulted in increased contract costs.

Problems With Government-Furnished Equipment Installations

The Navy also seeks to improve its ships by installing the latest, most advanced systems and equipment. However, new systems and equipment are not always ready to be installed when scheduled, which delays ship construction and consequently increases construction costs.

For example, attack submarines, beginning with the SSN-751, were to have included a new combat system (SUBACS); however, the system was not ready for installation when needed, and the Navy replaced it with a subset of the system. The replacement system, according to the Electric Boat Division and Newport News Shipbuilding—the contractors for attack submarines—caused construction delays because the structure drawings for the originally planned system were not accurate for the replacement system. It also caused costs to increase because the replacement system required changes, including heavier deck supports and relocation of electric components. These changes added substantially to the construction cost of the submarines.

In another instance, according to a Navy official, Newport News Shipbuilding only partially installed a vertical launch system in the SSN-721, -722, -723, and -750 attack submarines it was building because the

system was not completely ready. As a result, work was delayed and the overall cost of the submarines increased because Newport News had to finish outfitting these submarines with the system at a later date.

Changes to Contracts

During the performance of a ship construction contract, many changes are made to the original work. For example, under a 1981 contract with Newport News Shipbuilding to construct four attack submarines, the Navy has made 4,299 changes increasing the contract's initial target cost of $773.5 million to the current target cost of $833.3 million—a $59.8 million increase.

According to Navy officials, change orders present shipyards with an opportunity to be aggressive in recovering from their initial low bids; that is, in addition to the work and cost necessitated by change orders, shipyard officials claim delays or disruptions are attributable to the Navy. For example, a formal change order can require employees to be temporarily reassigned from their primary duties to secondary duties, which decreases productivity and consequently increases construction costs.

Low Productivity of Shipyards

According to shipyard and Navy officials, low productivity of shipyards increases ship construction costs by requiring more than the budgeted or planned labor hours to build ships. Productivity is highest when a shipyard's work force is at an optimum mix of skills and numbers. However, shipyards have difficulty in maintaining an optimum mix. In times of slowed activity, shipyard officials said that they were reluctant to release highly skilled workers because of the difficulty in retrieving them at a later date. For example, after Newport News Shipbuilding ceased bidding on submarine overhaul work, it had about 5,200 employees dedicated to that type of work. Newport News furloughed 1,200 employees and let go another 1,800. The remaining 2,200 employees were absorbed in other areas of the shipyard. According to local Navy officials, absorbing these additional employees increased labor costs and decreased overall productivity.

Unanticipated increases in overhead rates and labor costs can make it difficult for shipyards to achieve the productivity assumed in their bid process. For example, according to a Pennsylvania Shipbuilding Company official, the winning bid to build four oilers was based on the shipyard having 3,000 workers at a labor rate of $8 per hour over a 5-year period. At that labor rate, the shipyard could hire only 1,850 workers.

Having fewer workers to do the same amount of work required overtime pay, which increased the shipyard's construction costs.

Contract Types for Lead Ships

According to shipyard officials, it has become widely recognized in the industry that the use of a fixed-price contract is not compatible with the development of a highly complex ship. Shipyard officials said that a fixed-price contract appears to be appropriate when dealing with a known procurement because many of the problems associated with performance of the contract should have been identified and actions taken to correct them. Both shipyard and Navy officials said that using fixed-price type contracts for lead ships involves risks that are not totally known to either the shipyards or the Navy when entering into a contract and consequently usually results in contract cost growth.

As an example, the first Arleigh Burke class guided-missile destroyer is being procured under an FPI contract awarded in April 1985. As of September 1989, the contract's target cost had increased from $268.1 million to $324 million, or 21 percent, and the completion cost was estimated to be $499.6 million, or 54 percent, above the current target cost. In September 1989, Department of Defense policy was changed to preclude fixed-price type contracting for a lead ship.

Adjustments and Claims

Shipyard officials submit requests for contract adjustments and claims when a shipyard incurs expenses that shipyard officials believe were not covered by its contracts and were the result of the Navy's actions or inactions. Causes often cited by shipyard officials for contract adjustments or claims include disputes over the amount of money owed for completed work and late or defective government-furnished information or equipment.

Budgeting for Cost Growth

The Navy's shipbuilding and conversion account has sufficient funds to cover all current ship construction contract cost growth. The account is sufficient because of (1) Navy procedures and practices for budgeting ship construction programs and (2) existing authority to redistribute surpluses and to adjust appropriated funds within each ship construction program.

Navy officials said that they do not foresee any major problems in covering the Navy's share of the projected $3.6 billion in cost overruns and the potential $0.4 billion for contract adjustments and claims. However, some contract implementation practices for contracts experiencing cost overruns, as well as some adjustment and claim trends, may have future cost implications for the Navy.

Budgeting Procedures and Practices

The Navy's budgeting procedures and practices for requesting ship construction appropriations help to ensure that sufficient funds are available to cover shipbuilding contract cost growth. These procedures and practices take into account the fact that the appropriation obtained by the Navy from the Congress is for the Navy's estimate of the total costs to build the ships, not the actual bids accepted to build the ships. As discussed throughout this report, contract bids are generally well below the eventual contract cost.

Our analysis of 46 of the 62 contracts reviewed shows the total amount of initial ship construction appropriated funds of $23,037.6 million for basic construction exceeded the total contract award price of $21,234.7 million by $1,802.9 million, or 8.5 percent. In addition, as of September 1989, the current total amount of appropriated ship construction funds of $24,727.4 million for basic construction and change orders on these same contracts was $2,753.2 million, or 12.5 percent, more than the current total contract price of $21,974.2 million. These funds represent $1,085.1 million, or 65 percent, more than the Navy's current total share of projected net cost overruns and potential contract adjustments and claims ($1,668.1 million).

Redistribution Authority

Following congressional guidance, the Departments of Defense and the Navy routinely redistribute appropriated funds to cover funding deficiencies, including ship construction cost growth, through transfer authorizations and reprogramming actions. For example, since fiscal

year 1985, the Navy has processed 13 reprogramming actions that redistributed $121 million within the shipbuilding and conversion account to cover ship construction cost growth.

The Navy's ship construction program managers also have the flexibility of adjusting the amount of appropriated funds within each ship construction program to cover funding deficiencies. For example, the basic construction cost element for the fiscal year 1989 attack submarine program increased from $610.5 million in February 1988 to $680 million in January 1989, or 11 percent, and the propulsion cost element decreased from $185 million to $167.7 million, or 9 percent. Additional revisions were made in the cost elements for planning and future characteristic changes, which increased, and for electronics, hull maintenance, miscellaneous cost, and escalation, which decreased. Overall, this submarine program had a net $42 million increase during this period.

With the approval of the Naval Sea Systems Command's Shipbuilding and Conversion Appropriation Division, the ship construction program managers have no monetary limit on the amount of funds that can be moved among cost elements within the fiscal year's ship construction appropriations. The managers are limited only by contract and other liabilities when decreasing amounts for one purpose (e.g., electronics) to cover another purpose (e.g., escalation); they do not otherwise have a monetary limit in making such actions. According to a Navy official, this feature is used extensively to cover fund deficiencies within the ship construction program.

Contract Implementation Practices

Some contract implementation practices for contracts that are experiencing cost overruns may have future cost implications for the Navy. For example, when shipyards have exceeded their contract ceiling prices in the past, the Navy has agreed in some instances to contract modifications, such as revising FPI cost share arrangements and converting FPI contracts to FFP contracts. We are concerned that these modifications could establish a precedent of significant importance in Navy shipbuilding programs.

We found that the Navy awarded Bath Iron Works Corporation an FPI contract in 1985 to design and construct the lead ship of the Arleigh Burke class destroyer program. As of September 1989, the cost overrun on this contract was $175.6 million, of which the shipyard's share was $78.1 million. At that point, according to Navy data, the shipyard would have incurred a net $41.5 million loss on the contract. However, in mid-

September 1989, the Navy adjusted this contract by negotiating a contract modification that consisted of a number of changes in the contract's work scope.[1] According to the Navy, the contract was modified to provide a more appropriate sharing of contract risk associated with performing work that was not clearly defined in the original contract. According to the Navy's estimates, the shipyard's share of the projected cost overrun will be reduced from $78.1 million to $40 million, and its net $41.5 million loss will be reduced to zero.

In another instance, the Pennsylvania Shipbuilding Company was awarded an FPI contract in 1985 to build two oilers with an option for two more. According to a company official, because the shipyard was experiencing productivity and financial problems, the Navy agreed to transfer the option for the two additional ships to Avondale Industries, Inc., under an FFP contract and to convert the contract for the original two ships to an FFP contract. Before the conversion, the Navy was projecting a $160.6 million contract cost overrun. The Pennsylvania Shipbuilding Company later ceased operations as a shipbuilder. The two ships under construction were terminated for default and were later awarded under a reprocurement contract to Tampa Shipbuilding.

Adjustment and Claim Trends

Historically, shipyards in a loss position or approaching such a position have made claims against the Navy. The Naval Ship Procurement Process Study of the late 1970s stated that the Navy suffered from unrealistic prices in the long run because shipbuilders facing losses on contracts were likely to submit claims.

Our analyses show that many ship construction contracts with large overruns also have requests for contract adjustments or claims submitted. Conversely, many contracts with no or small overruns also have no or few contract adjustments or claims submitted. For example, Bath Iron Works Corporation and Ingalls Shipbuilding, Inc., both have contracts to construct guided-missile cruisers, but only Bath Iron Works, which has substantial overruns on its contracts, has submitted requests for contract adjustments and claims.

[1]Changes included revisions in ship specifications resulting from maturing design, definitization of authorized changes, resolution of essentially all outstanding contractual issues, increased contractor guaranty, late delivery penalties, and contract risk adjustments on share and ceiling ratios.

Scope and Methodology

To update the status of potential cost growth on Navy ship construction contracts, we interviewed officials at and obtained documents from Navy Headquarters—the Office of the Assistant Secretary of the Navy (Shipbuilding and Logistics),[1] the Office of the Comptroller, and the Naval Sea Systems Command—Washington, D.C. At Navy Headquarters, we reviewed cost data on the Navy's 62 shipbuilding and conversion fixed-price contracts. These contracts accounted for all open Navy ship construction contracts as of December 31, 1988. They covered 20 Navy ship programs involving 176 vessels at 17 private shipyards. For these contracts, we obtained and analyzed the most recent budget data and other financial data to establish the magnitude of potential contract cost overruns and the extent of contract adjustments and claims as of September 1989. In addition, we interviewed Navy officials and obtained information on the reasons and budget implications of cost growth.

We also interviewed officials at six private shipyards and Navy officials at the concerned Navy contract oversight offices and obtained information on contract costs, claims potential, and reasons for cost growth from these organizations. The six private shipyards were (1) Bath Iron Works Corporation, Bath, Maine, (2) General Dynamics Corporation (Electric Boat Division), Groton, Connecticut, (3) Ingalls Shipbuilding, Inc., Pascagoula, Mississippi, (4) National Steel and Shipbuilding Company, San Diego, California, (5) Newport News Shipbuilding, Newport News, Virginia, and (6) Todd Shipyards Corporation, San Pedro, California. The contract oversight offices were Supervisors of Shipbuilding, Conversion and Repair.

We selected these six shipyards because, in March 1989, they were performing 86 percent of the Navy's ongoing ship construction program. In addition, in March 1989, five of these shipyards had been awarded contracts involving most of the ship construction contract cost overruns and the other shipyard had the most ship construction cost overruns as a percentage of its total Navy shipbuilding program.

During our review, we discussed ship construction with officials at the Office of the Secretary of Defense, Washington, D.C.; the Navy's Competition Advocate General, Washington, D.C.; the Shipbuilders Council of America, Washington, D.C.; and the Pennsylvania Shipbuilding Company, Chester, Pennsylvania, which recently ceased operations as a shipbuilder.

[1]This office is now referred to as Research, Development and Acquisition.

In conducting our review, we used the same accounting systems, reports, records, and statistics that the Navy uses for ship construction to make decisions, establish program budgets, and monitor contracts. We did not independently determine their reliability.

Our review was performed from June 1989 through March 1990 and was conducted in accordance with generally accepted government auditing standards.

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