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NAVY MAINTENANCE

Cost and Schedule Performance at San Diego and Long Beach Shipyards



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

National Security and
International Affairs Division

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December 9, 1992

The Honorable Dana Rohrabacher
The Honorable Mervyn M. Dymally
The Honorable Robert K. Dornan
The Honorable Glenn M. Anderson
House of Representatives

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This report responds to your request for cost and schedule information on ship repairs completed at shipyards in the San Diego and Long Beach areas during fiscal years 1989 to 1991. Specifically, we compared (1) the contract award prices with the final contract prices for ship repairs completed by private shipyards, (2) the government cost estimates at the start of repair with the actual costs at completion for ships completed by the Long Beach Naval Shipyard, and (3) the original completion schedules with the actual completion dates for both private and public shipyards. We also compared the cost and schedule performance of San Diego area private shipyards with the performance of Long Beach area private shipyards. We did not contrast private and public shipyards because their data bases and operations were not comparable.

Background

The Navy repairs ships at both public and private shipyards. Repair work is either assigned to a public shipyard, awarded to a private shipyard through competition, or assigned to a shipyard through public/private competition. During fiscal years 1989 to 1991, repairs were completed on 150 ships in the San Diego and Long Beach areas. Of these repairs, 23 were completed at the Long Beach Naval Shipyard, 33 were completed at three Long Beach area private shipyards, and 94 were completed at seven San Diego area private shipyards. The repairs ranged from regular overhauls to shorter, intermittent repairs. Table 1 shows the type of ships repaired at each location.

**Table 1: Type of Ships Repaired
During Fiscal Years 1989 to 1991**

Type of ship	Long Beach Naval Shipyard	Private shipyards	
		Long Beach	San Diego
Aircraft carriers	1	0	3
Battleships	2	0	0
Cruisers	5	0	11
Destroyers	3	2	15
Frigates	6	17	25
Amphibious ships	3	9	28
Mine countermeasures ships	0	1	4
Auxiliary ships	1	4	6
Floating dry docks	2	0	2
Total	23	33	94

Results in Brief

Cost growth and schedule overruns at the San Diego and Long Beach area private shipyards were quite similar. The cost growth averaged about 30 percent in both areas. In the San Diego area, cost growth was experienced on 84 of 94 ships and schedule overruns occurred on 47 of 94 ships. In the Long Beach area, cost growth was experienced on 31 of 33 ships and schedule overruns occurred on 19 of 33 ships.

At the Long Beach Naval Shipyard, cost growth was experienced on 8 of 23 ships and schedule overruns occurred on 10 of 23 ships. Overall, there was almost no difference between the government cost estimates at the start of repair and the actual costs at completion. Two factors that account for this condition are that the government estimate (1) generally includes a 10-to-15 percent growth factor and (2) is an agreed upon price negotiated by the shipyard and the Navy before the start of the work.

Cost Growth at Private Shipyards

Cost growth averaged about 30 percent at both San Diego and Long Beach area private shipyards. Table 2 summarizes our comparison of the contract award prices with the final completion prices for the 127 ships completing repairs during fiscal years 1989 to 1991.

Table 2: Cost Comparisons for Private Shipyards

Dollars in millions				
Location	Number of ships	Award amount	Final price	Percent change
San Diego	94	\$535	\$697	30.3
Long Beach	33	133	174	30.8
Total	127	\$668	\$871	30.4

Both fixed-price and cost reimbursement type contracts were used for the repairs. The final prices exceeded the award amounts on 84 of the 94 ships repaired at San Diego shipyards and 31 of the 33 ships repaired at Long Beach shipyards. The award amounts generally were less than the cost estimates the Navy had developed for budget projections and comparative purposes before awards.

Our analysis showed that cost growth was quite similar when like ships and type of repairs were compared. Table 3 shows this comparison for those frigates completing certain repairs (selected restricted availabilities) during fiscal years 1989 to 1991.

Table 3: Cost Comparisons for Frigates

	San Diego	Long Beach
Number of ships	11	9
Number of ships with cost growth	11	8
Average cost of repair	\$2,380,000	\$2,220,000
Average cost growth	\$440,000	\$460,000
Range of cost growth		
High	\$790,000	\$930,000
Low	\$90,000	\$110,000
Overall percent of cost growth	22.9	22.7

Cost growth at private shipyards has been a problem for many years. In January 1986, we reported¹ that cost growth was about 50 percent on 105 contracts completed throughout the United States between October 1981 and May 1985. Similarly, in July 1990, we reported² that cost growth was about 30 percent on 402 contracts completed around the country between fiscal years 1985 and 1988.

¹Navy Maintenance: Costs to Overhaul Navy Ships at Private Shipyards (GAO/NSIAD-86-27, Jan. 9, 1986).

²Navy Maintenance: Cost Growth and Schedule Overrun Problems Continue at the Shipyards (GAO/NSIAD-90-144, July 24, 1990).

Schedule Overruns at Private Shipyards

Original schedule completion dates frequently were exceeded at both San Diego and Long Beach area private shipyards. Table 4 summarizes our analysis of completion dates for the 127 ships completing repairs during fiscal years 1989 to 1991.

Table 4: Schedule Overruns at Private Shipyards

Location	Number of ships	Ships with overruns	Percent with overruns
San Diego	94	47	50.0
Long Beach	33	19	57.6
Total	127	66	52.0

Schedule overruns for the 47 San Diego ships averaged 35 days, with 18 ships exceeding 30 days. The overruns ranged from 3 days to 175 days. Schedule overruns for the 19 Long Beach ships averaged 33 days, with 8 ships exceeding 30 days. The overruns ranged from 6 days to 102 days.

Our July 1990 report also noted that original schedule completion dates frequently were exceeded at private shipyards. During fiscal years 1985 to 1988, work on 169 of 453 ships, or 37 percent, overran the original schedules by an average of 43 days.

Long Beach Naval Shipyard

The Long Beach shipyard experienced little difference between the government cost estimates at the start of repair and the actual costs at completion. Our comparison for work completed on 23 ships between fiscal years 1989 and 1991 showed that the government cost estimates totaled \$403.7 million and the actual costs totaled \$403.6 million. However, 8 of the 23 ships did have cost growth, ranging from \$132,000 to \$16.9 million and averaging \$4.1 million.

Some of the ships also had schedule overruns. Our analysis showed that 10 of the 23 ships had schedule overruns. They ranged from 1 day to 49 days and averaged 22 days.

Our July 1990 report also commented on the performance of public shipyards during fiscal years 1985 to 1988. We reported that cost growth averaged 3 percent on the 238 ships repaired during that period and 54 percent of the ships had schedule overruns.

A major reason for the small overall difference between the government estimates and the actual costs is that the government estimate is an agreed

upon price negotiated between the shipyard and the customer (the Naval Sea Systems Command or the Fleet). The government estimate also generally includes a 10-to-15 percent growth factor.

Factors Contributing to Cost and Schedule Problems

Our review of individual ships indicated that the causes of cost growth and schedule overruns were generally the same as the causes identified in our July 1990 report. These reasons included inability to determine exact maintenance requirements beforehand, inadequate and late government furnished information and materials, government-caused delays and disruptions, and work added after start of repair. In commenting on our July 1990 report, the Department of Defense stated that the Navy had taken a series of initiatives to minimize the cited problems. During our current review, Navy officials stated that the benefits of these initiatives were not apparent during fiscal years 1989 to 1991 but would be realized after that period.

Agency Comments

On November 17, 1992, the Department of Defense provided oral comments on a draft of this report. The Department agreed with the findings except for our methodology of calculating cost growth in the private sector. The Department stated that rather than comparing the contract award prices with the final contract prices, the award prices should be adjusted for work that is subsequently authorized and funded through contract change orders before making these comparisons. The Department also reemphasized that the private and public shipyards cannot be contrasted because the data bases and operational methodology for each sector are not comparable.

With regard to the Department's comment on our methodology of calculating cost growth, our intention was not to imply that the contract change orders and resultant cost increases were unwarranted. Nevertheless, we were asked to compare the contract award amounts with the final contract prices and our report does enumerate the reasons for the increases.

Scope and Methodology

To accomplish our objectives, we held discussions and reviewed pertinent documents at Navy headquarters; Surface Force, Pacific; Long Beach Naval Shipyard; and Long Beach and San Diego Supervisor of Shipbuilding, Conversion, and Repair offices. We also obtained data from the Naval Sea Systems Command on depot-level repairs completed at the

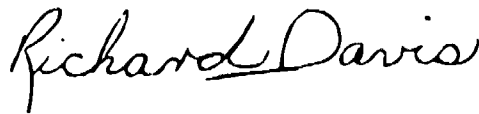
San Diego and Long Beach area private shipyards and the Long Beach Naval Shipyard between fiscal years 1989 and 1991.

To verify the provided data and to identify the causes of cost growth and schedule overruns, we reviewed Navy contract files, cost records, and other historical records. For all private shipyard repairs with cost growth of at least one million dollars, we reviewed the six largest contract modifications to determine the reasons for the modifications. For all private shipyard repairs with schedule overruns of at least 30 days, we reviewed all contract modifications extending the completion date to determine the reasons for the extensions. We performed similar cost and schedule analyses at the Long Beach Naval Shipyard.

Our review was made in accordance with generally accepted government auditing standards and was performed between June and October 1992.

We are sending copies of this report to the Chairmen and Ranking Minority Members, Senate and House Committees on Armed Services and on Appropriations; the Chairmen, Senate Committee on Governmental Affairs and House Committee on Government Operations; the Director, Office of Management and Budget; and the Secretaries of Defense and the Navy.

Please contact me on (202) 275-6504 if you or your staff have any questions. Major contributors to this report are James Murphy, Assistant Director, National Security and International Affairs Division, Washington, D.C.; and Dennis DeHart, Evaluator-in-Charge, Elinor Yerkes, Site Senior, and James Nolan, Evaluator, Los Angeles Regional Office.



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