

December 1, 2005

Honorable Joel Hefley
Chairman
Subcommittee on Readiness
Committee on Armed Services
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

In response to your request, the Congressional Budget Office (CBO) has assessed the two financial mechanisms—working-capital funding and mission funding—that the Navy uses to fund its four shipyards. CBO compared the two approaches on the basis of the operational and financial flexibility they may provide to the Navy. CBO also compared the types of cost and performance data that are now reported to the Congress for the working-capital-funded and mission-funded shipyards and investigated whether the provision of more-detailed data would be feasible and could assist Congressional oversight. In addition, CBO considered the implications of both approaches for funding capital improvements at the Navy's shipyards.

The enclosure describes the interim results of the ongoing analysis by CBO's National Security Division. CBO plans to provide a complete report to the Committee in the spring of 2006. If you would like further details at this time, we would be pleased to provide them. The enclosed analysis was prepared by Daniel Frisk, who can be reached at (202) 226-2761, and by R. Derek Trunkey, who can be reached at (202) 226-2916.

Sincerely,



Douglas Holtz-Eakin

Enclosure

Identical letter sent to the Honorable Solomon Ortiz

cc: Honorable Duncan Hunter
Chairman
House Committee on Armed Services

Honorable Ike Skelton
Ranking Member
House Committee on Armed Services

Honorable Joel Hefley
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cc: Honorable John Warner
Chairman
Senate Committee on Armed Services

Honorable Carl Levin
Ranking Member
Senate Committee on Armed Services

Honorable Jim Nussle
Chairman
House Committee on the Budget

Honorable John M. Spratt, Jr.
Ranking Member
House Committee on the Budget

Honorable Judd Gregg
Chairman
Senate Committee on the Budget

Honorable Kent Conrad
Ranking Member
Senate Committee on the Budget

Comparing Working-Capital Funding and Mission Funding for Naval Shipyards: An Interim Report

December 1, 2005

Note

Unless otherwise indicated, all years referred to in this report are federal fiscal years.

Introduction and Summary

The Navy currently owns and manages four shipyards: the Norfolk Naval Shipyard in Portsmouth, Virginia; the Portsmouth Naval Shipyard in Kittery, Maine; the Puget Sound Naval Shipyard in Bremerton, Washington; and the Pearl Harbor Naval Shipyard in Pearl Harbor, Hawaii. Each of those facilities operates under one of two distinct financial systems. The Norfolk and Portsmouth shipyards are financed through the Navy Working Capital Fund (NWCF), a revolving-fund mechanism under which Navy units pay for maintenance and repair services at a shipyard out of their appropriated funds, at prices that are intended to cover the shipyard's full operating costs. The Puget Sound and Pearl Harbor shipyards, which had been under the NWCF, are now funded through direct appropriations, an approach known as "mission funding."

Naval shipyards have operated under some form of revolving-fund financial system for decades. As part of the Navy's ongoing Regional Maintenance Plan, however, Pearl Harbor was shifted from working-capital funding to mission funding on October 1, 1998, and Puget Sound on October 1, 2003.¹ The Navy intends to move the Norfolk and Portsmouth shipyards to mission funding "at the earliest possible date."²

At the request of the House Committee on Armed Services, the Congressional Budget Office (CBO) is studying the advantages and disadvantages of working-capital funding and mission funding in general and as they apply to naval shipyards in particular. Critics have expressed concern that mission funding makes shipyards' costs and operations less visible and reduces shipyards' ability to obtain capital to replace equipment and make improvements. This document is an interim report on CBO's study. The Navy continues to respond to requests for information and data on the costs and operations of the shipyards. Once CBO has that information and data, it will be able to more fully address all of the issues associated with shipyard funding mechanisms, which will be incorporated into a final report.

CBO's preliminary findings indicate that both working-capital and mission funding, as currently managed, have strengths and weaknesses as shipyard funding systems.

- Working-capital funding requires shipyards to track and report their costs in order to determine operating results (profits or losses) and future billing rates. Mission funding reduces the availability of data on shipyards' costs to Navy headquarters and the Congress, in part because appropriate cost reports have not been requested

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1. The Navy's Regional Maintenance Plan consists of three phases: 1) consolidating intermediate-level activities to optimize intermediate-level maintenance, 2) integrating intermediate- and depot-level activities, and 3) conducting fleet maintenance using a single maintenance process. The Pearl Harbor and Puget Sound transitions to mission funding are part of phase 2. For more details, see Department of the Navy, *Report to Congress: Pearl Harbor Regional Maintenance Pilot* (May 2001); and General Accounting Office (now the Government Accountability Office), *Depot Maintenance: Status of the Navy's Pearl Harbor Pilot Project*, GAO/NSIAD-99-199 (September 1999).
 2. U.S. Pacific Fleet and Naval Sea Systems Command, *Report on Study of Lessons Learned and Costs and Benefits of Mission Funding at Pearl Harbor Naval Shipyard: Discussion of Public Shipyard Alternatives/Effects* (October 2003), p. 4.

or developed. There does not appear to be any reason why costs could not be tracked for mission-funded activities. CBO has designed a summary table (included at the end of this document) that could serve as a template for shipyards' potential reports to the Congress, regardless of their funding mechanism.

- Mission funding can help the Navy smooth out a shipyard's workload—thus reducing the probability that workers will be idle—and can make it easier to share workers among maintenance facilities. Although those actions are also possible under working-capital funding, the required paperwork and funding transfers could, in some cases, cause delays in their execution.
- The available data indicate no relationship between a shipyard's funding system and its level of capital expenditures.
- Because of differences in the costs borne by customers under each system, working-capital funding can lead to underuse of shipyard capacity, whereas mission funding can lead to overuse.

Maintenance of Navy Ships

The Navy classifies ship maintenance activities as organizational-, intermediate-, or depot-level.³ Organizational-level maintenance, which involves routine tasks such as inspection, lubrication, and assembly of minor parts, is typically conducted by a ship's crew without external assistance. Intermediate-level maintenance, which is performed by Navy and civilian personnel at designated facilities (including on tender ships), requires more-specialized work on ships' systems and equipment. Depot-level maintenance, which is usually carried out by civilians at shipyards, involves the most exhaustive work, such as ship overhauls, alterations, refits, restorations, and major repairs.⁴ Shipyards generally possess the equipment and skills present at intermediate-level facilities, but intermediate facilities cannot duplicate all of a shipyard's capabilities.⁵ Individual shipyards and intermediate facilities tend to work on specific classes of ships (see Table 1).

The Navy also classifies maintenance work by what it calls availabilities (based on when a ship is available for maintenance). A "fleet maintenance activity availability" occurs when a ship is at its home port for short periods between operations; a "Chief of Naval Operations (CNO) maintenance availability" occurs when a ship is scheduled to be at a naval or private shipyard for an extended period.⁶ Unscheduled avail-

3. Department of the Navy, *Naval Doctrine Publication 4: Naval Logistics* (1995), p. 28.

4. Department of the Navy, *Fiscal Year 2006/FY 2007 Budget Estimates: Navy Working Capital Fund* (February 2005).

5. General Accounting Office, *Depot Maintenance: Key Financial Issues for Consolidations at Pearl Harbor and Elsewhere Are Still Unresolved*, GAO-01-19 (January 2001), p. 22.

6. Department of the Navy, *Joint Fleet Maintenance Manual* (October 7, 2005), pp. II-I-1B-1, II-I-3-3, and II-I-4-8. There are also subcategories of availabilities for types of maintenance, such as overhaul, refueling, or conversion.

Table 1.

The Navy's Depot- and Intermediate-Level Maintenance Facilities

Facility	Location	Types of Ships Maintained
Depot-Level Maintenance		
Norfolk Naval Shipyard	Portsmouth, Va.	Any type of Navy ship
Pearl Harbor Naval Shipyard ^a	Pearl Harbor, Hawaii	Nuclear submarines and nonnuclear surface ships ^b
Portsmouth Naval Shipyard	Kittery, Maine	Nuclear attack submarines
Puget Sound Naval Shipyard ^c	Bremerton, Wash.	Any type of Navy ship
Intermediate-Level Maintenance		
Intermediate Maintenance Facility ^c	Bangor, Wash.	Ballistic missile submarines
Mid-Atlantic Regional Maintenance Center	Norfolk, Va.	Any type of Navy ship (Detachments in Bahrain and Naples, Italy)
Naval Ship Support Facility	New London, Conn.	Nuclear attack submarines
Pearl Harbor Intermediate Maintenance Facility ^a	Pearl Harbor, Hawaii	Nuclear submarines and nonnuclear surface ships
Ship Repair Facility	Yokosuka, Japan	Nonnuclear surface ships
South Central Regional Maintenance Facility	Ingleside, Tex.	Minesweepers
Southeast Regional Maintenance Facility	Mayport, Fla.	Surface ships and nonnuclear aircraft carriers (Detachment in Pascagoula, Miss.)
Southwest Regional Maintenance Facility	San Diego, Calif.	Any type of Navy ship
Trident Refit Facility	Kings Bay, Ga.	Ballistic missile submarines

Source: Congressional Budget Office based on information from the Department of the Navy.

Note: These facilities exclude tender ships.

- a. Facilities merged to become Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility.
 - b. Pearl Harbor is also capable of performing emergency depot work on nuclear aircraft carriers.
 - c. Facilities merged to become Puget Sound Naval Shipyard and Intermediate Maintenance Facility.
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abilities—such as when a ship sustains battle damage or runs aground—can also arise. CNO availabilities typically involve depot-level maintenance performed at shipyards, whereas fleet availabilities generally involve organizational- and intermediate-level maintenance conducted at the ship’s home port. However, any backlog of maintenance—regardless of level—is likely to be taken care of while a ship is at a shipyard. Also, shipyards send their employees to support fleet availabilities when necessary.

Navy Maintenance Facilities

The Navy’s four shipyards performed a total of 4.0 million labor-days of direct work in fiscal year 2005.⁷ That work cost a total of about \$3.1 billion, according to CBO’s preliminary estimates—or close to \$800 per fully burdened (including all overhead) direct labor-day. Most of the naval shipyards’ work is for the Department of the Navy, with a focus on nuclear ships. A very small share of their work—typically 1 percent to 4 percent in all—is conducted for other Department of Defense (DoD) customers, other federal agencies, commercial customers, and foreign governments.

The Puget Sound and Pearl Harbor shipyards work primarily on ships belonging to the Navy’s Pacific Fleet, and the Norfolk and Portsmouth shipyards work mainly on ships of the Atlantic Fleet. (The two pairs of shipyards do similar types of work because the composition, structure, and missions of the Atlantic and Pacific Fleets are similar.) Under the Navy Working Capital Fund, shipyards are owned and operated by the Naval Sea Systems Command (NAVSEA), which manages their budgets and sets their operating procedures. Under mission funding, the Atlantic or Pacific Fleet assumes budgeting responsibility for shipyards, although NAVSEA continues to manage their technical and operational procedures.

The Navy also operates a number of intermediate-level maintenance facilities located in the United States and overseas. All intermediate facilities are mission funded and are owned and operated by the Atlantic or Pacific Fleet. CBO does not currently have data on costs, workload, or labor for all of those facilities.

Merging Navy Shipyards and Intermediate Facilities

The Navy is in the process of reorganizing maintenance facilities under its Regional Maintenance Plan, which aims to eliminate duplication and overlap of maintenance resources by integrating the depot- and intermediate-level maintenance facilities in a region under one command.⁸ To test that concept, the Navy selected the Pearl Harbor Naval Shipyard and the Pearl Harbor Intermediate Maintenance Facility for an integration pilot program in 1997. The service concluded that full integration required a common funding system (at the time, the Pearl Harbor shipyard was working-capital funded and the intermediate facility was mission funded), and it selected mission

7. Direct work involves tasks directly identifiable to a maintenance project. Indirect work involves administrative and support tasks.

8. Department of the Navy, *Report to Congress: Pearl Harbor Regional Maintenance Pilot*, p. 1.

funding over working-capital funding.⁹ Thus, the Navy considers the mission funding of shipyards to be a vital step in regional maintenance integration. In 2003, the service conducted a similar pilot project to integrate Puget Sound Naval Shipyard and intermediate facilities located on the West Coast.

According to the Navy, the Pearl Harbor and Puget Sound pilot programs have improved the shipyards' workforce and financial flexibility and have facilitated implementation of the Regional Maintenance Plan. The Navy plans to continue using mission funding for those shipyards and intends to switch the Norfolk and Portsmouth shipyards to mission funding as soon as possible.

Some observers, however, have questioned the applicability of the Navy's experience with Pearl Harbor and Puget Sound to the Portsmouth and Norfolk shipyards. They note, for example, that the distance between the shipyards and their nearest associated intermediate maintenance facilities varies considerably. According to the Government Accountability Office (GAO), the time required to travel between the intermediate maintenance facilities and shipyards is five to 10 minutes for Pearl Harbor, 20 to 30 minutes for Puget Sound, 30 to 45 minutes for Norfolk, and two to three hours for Portsmouth.¹⁰ The type of intermediate maintenance facility being integrated and the extent and nature of the integration also varies among shipyards. The intermediate maintenance facilities near the Norfolk and Pearl Harbor shipyards work on submarines and surface ships (including carriers, in the case of Norfolk). At Puget Sound, the nearest intermediate maintenance facility works exclusively on submarines (primarily Trident class strategic ballistic missile submarines). There is no plan to integrate the Portsmouth shipyard with any intermediate maintenance facility (including the East Coast's Trident submarine facility in Kings Bay, Georgia).

Private-Sector Shipyards

Private shipyards also provide depot maintenance for the Navy, primarily on nonnuclear surface ships. In 2005, \$1.7 billion, or about 40 percent, of depot maintenance funds for Navy vessels went to private shipyards.¹¹ The U.S. private-sector shipbuilding and repair industry is dominated by the so-called Big Six shipyards, which are owned by two parent companies:

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9. The Navy chose mission funding over working-capital funding for several reasons, including the fact that the mission-funded Pacific Fleet is Pearl Harbor's largest customer and the Navy expected that it would have to deal with fewer financial hurdles by relying on direct appropriations. See General Accounting Office, *Depot Maintenance: Key Financial Issues for Consolidations at Pearl Harbor and Elsewhere Are Still Unresolved*, p. 25.
 10. General Accounting Office (now the Government Accountability Office), *Depot Maintenance: Status of the Navy's Pearl Harbor Pilot Project*, p. 15.
 11. Data provided to CBO by the Navy on November 18, 2005. The \$1.7 billion figure excludes public/private partnerships and refuelings of nuclear carriers (performed only at Newport News Shipyard).

- General Dynamics (Marine Systems business segment):
 - Bath Iron Works in Bath, Maine (the lead designer and builder of the Arleigh Burke class guided-missile destroyer)
 - Electric Boat in Groton, Connecticut (delivered the lead Virginia class attack submarine and the final Seawolf class submarine)
 - National Steel and Shipbuilding Company in San Diego (specializes in auxiliary and support ships for the Navy and oil tankers and dry-cargo carriers for commercial markets)

- Northrop Grumman (Newport News and Ship Systems business segments):
 - Newport News Shipyard in Newport News, Virginia (the sole U.S. shipyard capable of designing, building, and refueling nuclear-powered aircraft carriers; also capable of designing and building nuclear-powered submarines)
 - Ingalls Shipyard in Pascagoula, Mississippi (the sole builder of the WASP class of large-deck multipurpose amphibious assault ships; a second source of the Arleigh Burke class guided-missile destroyer; and the lead design agent for the Navy's next-generation destroyer)
 - Avondale Shipyard in New Orleans and Tallulah, Louisiana, and Gulfport, Mississippi (the prime contractor for the San Antonio class of amphibious assault ships; has also built seven T-AKR strategic sealift ships for the Navy)

The Big Six shipyards accounted for two-thirds of the more than \$6.7 billion in total revenue of U.S. private-sector shipyards in 1998 and nearly 90 percent of private shipyards' work for the U.S. military. (Ninety-five percent of the six shipyards' revenues derived from the U.S. military.) The Big Six also accounted for 11 percent of U.S. private-sector shipyards' commercial revenues over the 1996-2000 period.¹² Ship repair is a significant part of private shipyards' workload: as of 2001, it generated between 30 percent and 40 percent of total revenues at all private-sector U.S. shipyards (not just the Big Six).¹³

In the past 20 years, the vast majority of ships delivered by U.S. shipyards have been purchased by the Navy. U.S. shipyards have a negligible share of the international market for commercial vessels (less than 0.25 percent of the gross tonnage delivered

12. Department of Commerce, *National Security Assessment of the U.S. Shipbuilding and Repair Industry* (May 2001).

13. *Ibid.*

worldwide in 2000). The world market for commercial ships is dominated by South Korea (with 35 percent of the market in 2000) and Japan (with 33 percent).¹⁴

The U.S. industry's share of the world commercial market might be even smaller except for two laws that encourage U.S. ship construction. The Merchant Marine Act of 1920 requires that all shipping between ports in the United States occur on vessels that were built in the United States, are owned and operated by U.S. citizens, and are registered in the United States. For example, tankers that transport oil from Alaska to ports elsewhere in the United States must satisfy all of those conditions. The Oil Pollution Act of 1990 requires that all bulk oil tankers entering U.S. ports be double-hulled by 2015. In response to that law, Avondale Shipyard is building five double-hulled crude-oil tankers (the first ever constructed in the United States) for Polar Tankers, a subsidiary of ConocoPhillips. Avondale delivered the first of those tankers, the Polar Endeavour, in early 2001.

Working-Capital Funding

Before the transition of Pearl Harbor and Puget Sound to mission funding, all naval shipyards operated under some type of revolving-fund financial system. The National Security Act Amendments of 1949 established working-capital funds to finance "industrial-type activities." In 1991, the Secretary of Defense created the Defense Business Operations Fund, consolidating individual industrial and stock funds (which financed parts and goods such as petroleum) into a single revolving fund.¹⁵ In 1996, to more clearly establish functional and financial management responsibilities, DoD split the Defense Business Operations Fund into four Defense Working Capital Funds: for the Army, Navy, Air Force, and DoD-wide.¹⁶

Under the Navy Working Capital Fund, as under the previous revolving funds, "providers of goods and services finance their continuing operations with income derived from sales to customers."¹⁷ Each year, the Congress appropriates funds to the Pacific and Atlantic Fleets for ship maintenance and to NAVSEA for ship modifications and conversions. As customers of the working-capital-funded (WCF) shipyards, operational units (primarily the Atlantic and Pacific Fleets) "purchase" maintenance services, and NAVSEA "purchases" modification and conversion services (see Figure 1). The income that each shipyard receives for the work it performs is used to pay for the shipyard's operations, including labor, materials, overhead, and capital depreciation. (Military construction is handled directly through military construction appropriations.)

14. R. LaVar Huntzinger and others, *Competition, Innovation, and Productivity in the Ship Industry* (Alexandria, Va.: CNA Corporation, 2001).

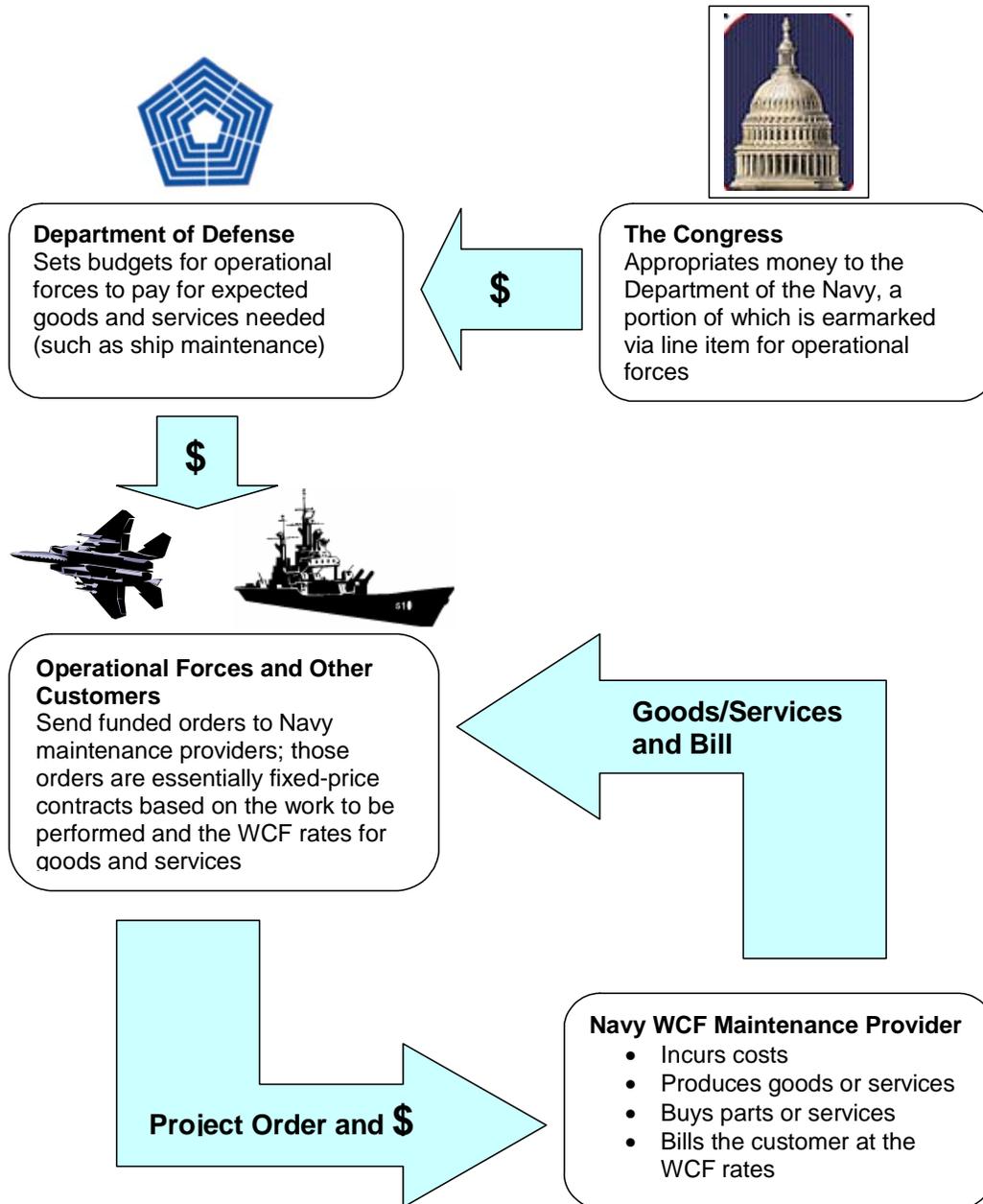
15. General Accounting Office, *Defense Depot Maintenance: Challenges Facing DoD in Managing Working Capital Funds*, GAO/T-NSIAD/AIMD-97-152 (June 1997), p. 6.

16. *Ibid.*, p. 6.

17. Office of the Secretary of Defense, "Revolving Fund Concept," Comptroller's Web site (www.dod.mil/comptroller/icenter/dwcf/revolvingfund.htm).

Figure 1.

How Working-Capital Funding Operates



Source: Congressional Budget Office based on the Office of the Secretary of Defense Comptroller's Web site (www.dod.mil/comptroller/icenter/dwcf/revolvingfund.htm).

Note: WCF = working-capital funding.

The shipyards set the rates they charge to cover all of their costs (except direct materials, which are billed to customers separately), and those rates remain fixed during a fiscal year.¹⁸ The budgets of the shipyards' customers are set to cover the expected level of work they will purchase at the rates in effect at the shipyards for that year. Customers obligate funds to the NWCF for a project order, fully funding a ship's maintenance before work begins. Differences between the expected demand for customer orders used to set a shipyard's rates and actual customer demand, or differences between a shipyard's expected and actual costs per labor-day, can cause the shipyard to experience a net profit or loss. Annual net profits or losses (net operating results) are incorporated into the next rate-setting cycle in an attempt to make the shipyard's future accumulated operating result (a cumulative measure of net operating results) equal to zero.

According to DoD, a primary purpose of its working-capital funds is to focus attention on the total costs of providing a good or service. The revolving funds are designed to enable DoD activities to operate more like businesses, in that the funds are structured to make customers and providers acutely aware of full costs and performance.¹⁹ If rates are set correctly, customers will know the true cost consequences of their decisions about ship maintenance, and they will allocate their funds to serve their needs most effectively.²⁰ Cost visibility also gives a shipyard's managers an incentive to operate the shipyard as efficiently as possible in order to lower their billing rates and avoid customer dissatisfaction.²¹ Inefficiencies will be reflected in net operating losses and higher future rates.

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18. The budget calendar necessitates that shipyards begin calculating their rates about 18 to 24 months before the fiscal year in which the rates will go into effect. For detailed information about the rate-setting process, see General Accounting Office, *Foreign Military Sales: DoD's Stabilized Rate Can Recover Full Cost*, GAO/AIMD-97-134 (September 1997).
 19. For more details about revolving funds, see R. Derek Trunkey and Jino Choi, *The Defense Business Operations Fund: Problems and Possible Solutions*, CRM 95-196 (Alexandria, Va.: CNA Corporation, March 1996); W. Brent Boning and Alan J. Marcus, *An Analysis of the Navy Working Capital Fund* (Alexandria, Va.: CNA Corporation, June 1999); and Christopher H. Hanks, Will H. Horn, and John F. Olio, *Stock Fund Operations in the Department of Defense*, ML 420 (McLean, Va.: Logistics Management Institute, April 1985).
 20. Charles J. Hitch and Roland N. McKean, *The Economics of Defense in the Nuclear Age* (Santa Monica, Calif.: RAND Corporation, 1960), p. 225.
 21. Navy shipyards do not face the same profit motives as private firms, which may reduce their incentive to control costs. Also, in a truly free market, customers would be able to shop around among service providers and select the best value. However, because both Navy and private shipyards tend to specialize in certain types of ships and maintenance work, and because the Navy often assigns ship maintenance to a specific facility, competition among providers is limited. See Trunkey and Choi, *The Defense Business Operations Fund*, pp. 24-25.

Mission Funding

Under mission funding, by contrast, direct appropriations authorize DoD to incur obligations for designated purposes, such as ship maintenance or modifications.²² The Congress appropriates money to the Department of the Navy, a portion of which is earmarked through line items for mission-funded support units, such as shipyards. The budgets of those support units are set at a sufficient level to pay for the expected amount of work to be performed by each unit (see Figure 2).

Mission-funded shipyards provide maintenance services to the Atlantic and Pacific Fleets for free, but they are still reimbursed by NAVSEA for modifications and conversions. (Both capital expenditures and military construction at mission-funded shipyards are funded through separate direct appropriations.) The rates for that reimbursable work are no longer set under WCF procedures, however. Currently, only costs for direct labor and materials are charged to NAVSEA when it requests a modification or conversion. Non-DoD customers will be charged a fully burdened rate, but that rate will also differ from the WCF rate since it will be set in the current fiscal year (rather than 18 to 24 months in advance) and will not necessarily include the same cost categories used to set rates under working-capital funding.²³

Comparing Working-Capital and Mission Funding of Shipyards

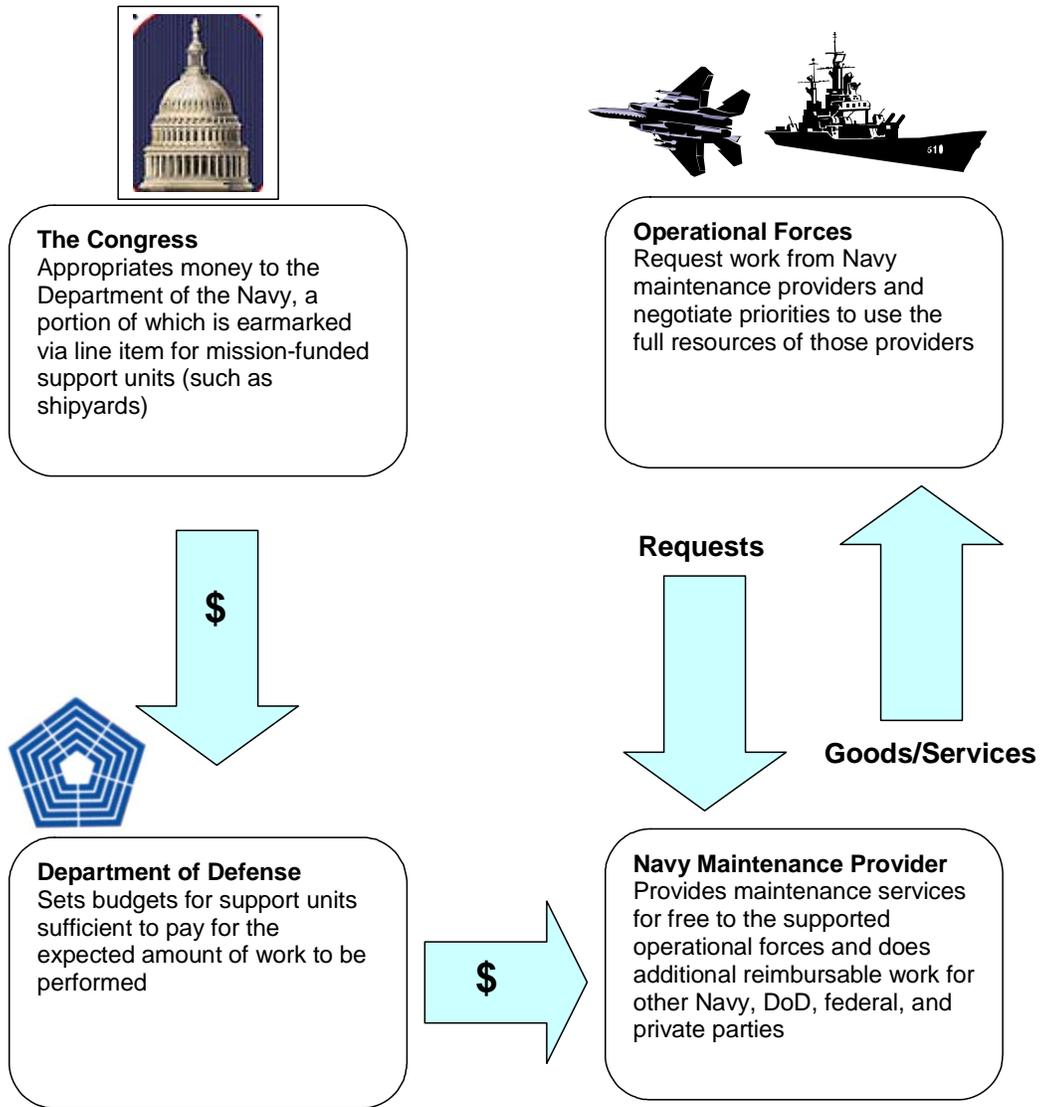
The Navy's view is that mission funding is a more effective financing mechanism for shipyards than is working-capital funding. Specifically, the Navy believes that mission funding provides advantages in terms of operational and financial flexibility and responsiveness. Outside the Navy, however, observers have expressed concern that moving to mission funding will eliminate some of the advantages of working-capital funding, especially cost visibility and accountability. The Office of the Secretary of Defense (OSD), GAO, and DoD's Inspector General have expressed concern that the performance of the Pearl Harbor and Puget Sound pilot programs has not been well documented and that appropriate metrics have not been developed to objectively compare shipyards' performance before and after the funding transition.²⁴ Some argue that the reduction in cost reporting associated with the Pearl Harbor and Puget Sound pilots may inhibit the Congress's ability to make informed decisions about shipyard funding.

In this interim report, CBO examines several of the potential advantages and disadvantages associated with mission- and working-capital-funded shipyards, including

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22. General Accounting Office, *Depot Maintenance: Status of the Navy's Pearl Harbor Pilot Project*, p. 5.
 23. The Navy is still developing a method for calculating a rate for non-DoD customers at mission-funded shipyards.
 24. General Accounting Office, *Depot Maintenance: Status of the Navy's Pearl Harbor Pilot Project*; General Accounting Office, *Depot Maintenance: Key Financial Issues for Consolidations at Pearl Harbor and Elsewhere Are Still Unresolved*; and meetings between CBO and officials from OSD and the DoD Inspector General's office, October 2005.

Figure 2.

How Mission Funding Operates



Source: Congressional Budget Office.

cost visibility, operational and financial flexibility, shipyard performance, capital replenishment (the ability to get enough funds to replace equipment), and economic and performance incentives. CBO's final report, to be published later, will include more data and information on those topics and will address several additional issues as information allows:

- The costs that the Navy should reimburse to the NWCF, when the Navy moves a shipyard to mission funding, to pay for assets whose value the NWCF has not yet recovered;²⁵
- Concerns that delays in direct appropriations could harm a mission-funded shipyard's continuity of operations between fiscal years; and
- The financial impact that transferring shipyards to mission funding has on activities remaining in the NWCF.

Cost Visibility

Moving a shipyard from working-capital to mission funding reduces the availability of cost data. Because they are not required to do so, most mission-funded DoD activities do not track their costs to perform work. DoD's financial accounting systems track revenues and spending, but in the absence of a need to set rates for customers requesting work, no effort is made to link that flow of money to specific work performed. For example, an intermediate maintenance facility may know the total amount it spends each year on travel but not the amount associated with each repair. In addition, mission-funded activities often manage costs separately according to the type of appropriation (military personnel, operations and maintenance, procurement, and so forth). As a result, calculating the total costs of shipyard operations would require identifying and aggregating funds appropriated in different accounts. Overhead, for example, has not been tracked as closely under mission funding as it has been under working-capital funding. Overhead costs are paid by a number of commands and funding streams, including the Atlantic and Pacific Fleets and the Commander of Naval Installations. Under working-capital funding, all overhead costs are accounted for and incorporated into the WCF rate. Under mission funding, shipyards account only for the overhead costs they pay directly.

Working-capital funding, by design, requires detailed awareness of costs. Shipyards must track all costs and allocate them to the work performed. WCF shipyards calculate a cost per repair and a cost per labor-day that are available in official reports; mission-funded shipyards currently do not calculate such unit costs on a regular basis because no official cost reports are required. The Navy maintains that costs are still visible after a shipyard moves to mission funding, but GAO, OSD, and DoD's In-

25. Those "buyout costs" include undepreciated capital assets, accrued employee leave, liabilities, and accumulated operating results. Estimates of the costs to buy out all four Navy shipyards range widely, from about \$50 million to \$500 million.

spector General have reported difficulty in obtaining reliable cost data from mission-funded shipyards.²⁶

There appears to be no inherent reason why unit costs cannot be tracked for mission-funded activities, but no reporting system is now in place to capture those costs.²⁷ Implementing such a system would have the advantage of providing cost information to the Navy, OSD, and the Congress that all have found useful in assessing the health and performance of an operation costing several billion dollars per year. (Such information was available when all shipyards were working-capital funded.) Of course, operating such an accounting system would involve some administrative and training costs.

Operational and Financial Flexibility and Responsiveness

The Navy considers increased flexibility and responsiveness to be major advantages of mission funding over working-capital funding. In the context of shipyards, flexibility is defined as the ability to move resources (particularly workers) between projects within a shipyard as well as between facilities. According to the Navy, the ability to share resources between maintenance facilities is an important aspect of its Regional Maintenance Plan. For example, the Puget Sound shipyard regularly sends employees to work at the Bangor Intermediate Maintenance Facility. Under mission funding, those resources are already paid for, so the transfer requires a minimal amount of paperwork. That flexibility can help smooth out the peaks and valleys in a workload associated with ship maintenance.²⁸ In a WCF shipyard, by contrast, the workers must be funded through customer obligations before they can work on a project. As a result, sharing resources between projects requires more paperwork, and in some cases, the ensuing delay could result in idle workers.²⁹ (One way to reduce problems associated with sharing WCF resources is for a fleet to “buy” a planned number of labor-days at the beginning of a fiscal year. The Norfolk shipyard currently provides about 100 civilian workers to support the nearby intermediate maintenance facility through such an arrangement.)

26. U.S. Pacific Fleet and NAVSEA, *Report on Study of Lessons Learned and Costs and Benefits of Mission Funding at Pearl Harbor Naval Shipyard*; General Accounting Office, *Depot Maintenance: Status of the Navy's Pearl Harbor Pilot Project*; General Accounting Office, *Depot Maintenance: Key Financial Issues for Consolidations at Pearl Harbor and Elsewhere Are Still Unresolved*; and meetings between CBO and officials from OSD, the DoD Inspector General's office, and Puget Sound shipyard, October 2005.

27. Naval Postgraduate School, *Unit Cost Handbook*, available at www.nps.navy.mil/drmi/98handbooks.htm; and Kent Miller, “Unit Costing Outside DBOF,” *Resource Management* (May 1992), p. 12.

28. Both the shipyards and fleets also say that more discussion and joint decisionmaking about maintenance schedules occur under mission funding than under working-capital funding.

29. CBO is attempting to determine the exact administrative procedures necessary to share resources under each funding mechanism.

Shipyards also say they have improved their ability to respond to unscheduled availabilities—such as ship collisions—under mission funding. If a ship is damaged, mission-funded shipyards can shift resources to that ship quickly and easily (most likely by delaying other, less urgent availabilities). However, WCF shipyards have responded to similar situations for decades. CBO has not yet determined whether mission-funded shipyards have a distinct advantage in responsiveness over WCF shipyards when unscheduled availabilities arise. Quantitatively measuring such responsiveness may be difficult, moreover, because each case can have unique aspects.

A potential drawback of freely sharing workers between shipyards and intermediate facilities under mission funding is the Navy’s ability to verify compliance with the “50-50 rule.” Under title 10, section 2466 of the U.S. Code, no more than 50 percent of annual depot maintenance can be provided by private contractors.³⁰ Intermediate-level maintenance is not included in that restriction. Distinguishing between depot and intermediate maintenance costs may become more difficult if resources are shifted between maintenance levels on a regular basis. According to the Navy, however, workforce flexibility does not affect 50-50 reporting because labor costs are assigned to specific maintenance jobs, which are categorized as intermediate- or depot-level.

Operational Performance

As noted above, OSD, GAO, and DoD’s Inspector General are concerned about whether appropriate metrics have been developed to objectively compare a shipyard’s performance before and after the shift from working-capital to mission funding. To address that issue, CBO selected seven metrics to measure a shipyard’s performance over time (see Table 2). Although no single metric can accurately gauge the success of shipyard operations, CBO chose metrics that, considered together, demonstrate shipyard performance. CBO is continuing to gather relevant data and will present an analysis in its final report.

Capital Replenishment

Some observers worry that mission-funded shipyards will have difficulty getting appropriations for their capital expenses, such as dock cranes and machining equipment. WCF shipyards make their own plans for capital replacement and include the cost of needed equipment in their rates, but mission-funded shipyards must compete with other Navy needs within the “Other Procurement, Navy” (OPN) accounts. Judging from the data on shipyards’ capital spending available to CBO (which cover only aggregate expenditures over the past 10 years), the level of capital-expense funding appears to be independent of a shipyard’s funding system (see Table 3). However, some people might argue that the data on capital expenditures undertaken at the Pearl Harbor and Puget Sound shipyards under mission funding cover a period that is less than the average lifetime of those shipyards’ equipment and thus are not conclusive.

30. For more information about the 50-50 rule and reporting, see General Accounting Office, *Depot Maintenance: DOD’s 50-50 Reporting Should Be Streamlined*, GAO-03-1023 (September 2003).

Table 2.**Possible Metrics of Shipyard Performance**

Metric	Calculation	Potential Weaknesses of Metric
Schedule Adherence		
Deviation from Planned Schedule	Actual starting or ending dates minus scheduled starting or ending dates	<ul style="list-style-type: none"> • Limited sample size • Factors outside shipyard's control may cause deviation from schedule • Planned schedule could be inflated to influence metric
Quality of Work		
Rework Required to Correct Work Deficiencies	Rework labor-days divided by total direct labor-days	<ul style="list-style-type: none"> • Reliable historical data may not be available
Ship Readiness	To be determined	<ul style="list-style-type: none"> • Changes in ship readiness may result from factors other than shipyard performance • Reliable historical data may not be available
Cost Management		
Total Annual Costs	Sum of direct and indirect military and civilian labor, direct materials, and overhead costs	<ul style="list-style-type: none"> • Shipyards must include the same cost categories • Mission-funded yards may have difficulty calculating overhead costs
Cost per Ship Availability	Direct labor-days worked on a ship multiplied by fully burdened rate per labor-day	<ul style="list-style-type: none"> • Availabilities, even within a ship class, have varying work requirements • Mission-funded yards may have difficulty calculating fully burdened rates and distinguishing between intermediate-level and shipyard costs
Burdened Labor Rate	Total annual costs divided by total annual direct labor-days	<ul style="list-style-type: none"> • Shipyards must include the same cost categories • Mission-funded yards may have difficulty calculating overhead costs
Administrative Efficiency		
Ratio Between Direct and Indirect Labor-Days	Direct labor-days divided by total labor-days	<ul style="list-style-type: none"> • Mission-funded yards may have difficulty distinguishing between intermediate-level and shipyard labor-days

Source: Congressional Budget Office.

Table 3.**Capital Expenditures at Naval Shipyards**

(Millions of 2006 dollars)

Shipyards	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Pearl Harbor										
WCF	4.2	14.0	7.9	*	*	*	*	*	*	*
Transition year	*	*	*	12.0	*	*	*	*	*	*
Mission funding	*	*	*	*	6.4	22.0	25.2	25.7	16.9	9.2
Puget Sound										
WCF	18.0	10.7	20.7	16.5	10.8	15.8	18.0	11.4	*	*
Mission funding	*	*	*	*	*	*	*	*	23.5	9.7
Norfolk (WCF)	19.0	23.4	22.4	21.6	44.7	17.2	35.6	17.3	16.5	21.6
Portsmouth (WCF) ^a	13.4	10.6	4.1	8.5	5.5	34.7	84.1	16.5	5.6	3.6

Source: Congressional Budget Office based on data from the Department of the Navy.

Note: WCF = working-capital funding; * = not applicable.

- a. The Portsmouth shipyard's large increase in capital expenditures in 2002 resulted largely from a \$62 million purchase of Enterprise Resource Planning software and hardware to be used at all naval shipyards.

Incentives for Shipyards Customers and Managers

Working-capital and mission funding introduce different economic and performance incentives, both for shipyard customers and for shipyard managers.³¹ In terms of customers' choices, working-capital funding can lead to underutilization of shipyards, whereas mission funding can lead to overutilization.

One criticism of working-capital funds is that they use expected-average-cost pricing rather than marginal-cost pricing to set rates. The rate that a WCF shipyard charges customers is based on total projected costs (including the accumulated results of prior years) and projected workload for a given year. Total costs thus include fixed costs and sunk costs that are independent of the amount of work performed as well as costs that vary according to workload. Consequently, the prices that shipyards charge customers for a specific task exceed the marginal (additional) cost of the work performed. If customers view those rates as too high, they may defer maintenance, reduce the scope of work to be performed at the shipyard, or (if possible) shift to a new maintenance pro-

31. A number of papers have thoroughly addressed the economics of revolving funds, including Boning and Marcus, *An Analysis of the Navy Working Capital Fund*; Edward G. Keating, *RAND Research Suggests Changes in Department of Defense Internal Pricing*, IP-216-DFAS (Santa Monica, Calif.: RAND, 2001); Edward G. Keating and others, *Challenges in Defense Working Capital Fund Pricing: Analysis of the Defense Finance and Accounting Service* (Santa Monica, Calif.: RAND, 2003); and Trunkey and Choi, *The Defense Business Operations Fund*.

vider—such as an intermediate maintenance facility—that is mission funded or does not include fixed costs in its prices.³²

Despite a customer’s perception that mission-funded maintenance providers are less expensive than WCF shipyards, the total cost to the Navy as a whole of performing a maintenance task (including all fixed costs) may either be higher or lower at a mission-funded facility. Thus, if customers avoid WCF shipyard rates, they may inadvertently be selecting a less cost-effective maintenance provider. Lost business can create unexpected dips in workload and excess labor capacity at WCF shipyards—and, when a net operating loss occurs, surcharges in future rates to recoup losses.³³ Analysts have proposed several changes to alleviate issues resulting from WCF pricing, such as introducing “membership dues” to cover fixed costs, allowing regular rate adjustments during a fiscal year, and returning profits (or charging losses) directly to the fleet or CNO. So far, the Department of Defense has declined to make such changes.

Mission funding, by contrast, may encourage customers to overuse a shipyard. Once a mission-funded shipyard receives its annual appropriation, the cost to the fleet of repairing a ship there is zero (other than waiting time). For reimbursable work, the shipyard currently charges a customer only for direct labor and materials, not a fully burdened rate.³⁴ Low prices encourage customers to send as much work to mission-funded shipyards as possible and virtually guarantee that the shipyards will always be busy. However, customers may requisition work that they would not request if they were directly responsible for paying the full cost of that work, resulting in an inefficient use of the Navy’s resources.

Working-capital and mission funding also provide incentives for improvements in shipyard performance through different mechanisms. Under working-capital funding, both shipyard customers and managers can instigate improvements in a shipyard’s productivity. If prices are too high, customers will complain to the shipyard, defer maintenance, or reduce the scope of work. Because all costs are identified and tallied to determine WCF rates, shipyard managers have access to a variety of cost measures as performance metrics. At the Department of the Navy and DoD levels, managers can keep tabs on the total costs of operating the shipyard in the context of the overall Navy and DoD budgets. At the facility level, managers can identify abnormally high costs to perform particular kinds of work and seek efficiencies. Also, examining a shipyard’s rates over time offers an indication of whether performance is improving or

32. A customer will be able to switch maintenance providers only if competition exists. Because both Navy and private ship facilities tend to specialize in certain types of naval vessels and maintenance work, competition among providers is limited.

33. Another criticism of WCF activities is that prices are the same for different types of work. Since some types of work are inherently more expensive to perform than others, working-capital funding may result in some customers’ subsidizing others. However, the fact that Navy shipyards tailor their rates on the basis of ship class reduces customer cross-subsidization.

34. Direct labor and materials may be an approximation of the marginal cost of a maintenance job.

worsening. If a shipyard consistently operates over or under capacity, it may be incorrectly sized.

Under mission funding, the Atlantic or Pacific Fleet, as the shipyard's owner and primary customer, is largely responsible for driving improvements in shipyard performance. If a shipyard's productivity improves, the fleet (as the customer) can direct additional work to it, or the fleet (as the owner) can reprogram the savings for other uses. Yet the absence of established and detailed cost accounting under mission funding may make it difficult for the fleet to determine the full cost of operating the shipyard, the costs of specific maintenance tasks, and the areas most in need of improvement. Furthermore, poor shipyard performance may be considered a minor issue in the context of the fleet's total operations and budget. As noted above, a mission-funded shipyard is always busy because once it is funded, the incentive for the fleet is to get as much work as possible out of it. Thus, there is no workload indicator to determine whether the shipyard is appropriately sized. Properly sizing a shipyard requires additional analysis, whereby the fleet (or the Navy) compares the value of the work being performed with its cost, which may not be visible under mission funding.

Shipyards' Reporting to the Congress

Having appropriately structured annual summary reports for each shipyard could enable the Congress to monitor shipyards' finances and performance regardless of the type of funding used to pay for their operations. Presently, the Congress receives a separate budget exhibit on WCF activities for each of the services. The Navy's WCF exhibit includes a section on shipyards that contains information about revenues, costs, workload, end strength, and rates.³⁵ Because the Pearl Harbor and Puget Sound shipyards are mission funded, they are no longer included in that exhibit. Although the Congress still receives separate budget exhibits on appropriations for mission-funded shipyards and their customers, the WCF budget exhibit is the only source of information about shipyards' cost and performance. Consequently, the Congress now lacks such information for half of the Navy's shipyards. This section addresses what shipyard data might be helpful to the Congress as part of a consolidated shipyard report, either instead of or in addition to existing budget exhibits.³⁶

CBO designed a summary table, containing high-level cost and performance metrics, to serve as a template for shipyards' potential reporting to the Congress. Table 4 on page 20 shows an example of that table for the Norfolk Naval Shipyard. (Analogous tables for the Portsmouth, Puget Sound, and Pearl Harbor shipyards and an aggregate table covering all four naval shipyards appear in the appendix.) The template is applicable for both WCF and mission-funded shipyards. In addition to the current fiscal

35. For an example, see Department of the Navy, *Fiscal Year 2006/FY 2007 Budget Estimates: Justification of Estimates—Navy Working Capital Fund* (February 2005).

36. Data for intermediate maintenance facilities could also be included in the shipyard report to the Congress since those facilities are being integrated with depots under the Regional Maintenance Plan.

year, it includes space for five years of past data and two years of projected data to provide historical context and reveal potential trends. The tables included in this document are set up for a 2006 annual report, but they contain only historical data because fiscal year 2006 is still in progress. Other missing data are either not applicable—such as the WCF rate, net operating result, or accumulated operating result for a mission-funded shipyard—or are not yet available (in the case of past numbers, because the Navy or CBO has not yet been able to assemble them). A narrative describing the primary capabilities of and major events affecting each shipyard could also be included in the table.

The first two sections of the table show revenues and costs. The purpose of those sections is to provide information about the overall financial condition of the shipyards as well as their primary sources of revenues and costs. Revenues are categorized by source and type of appropriation. For mission-funded shipyards, revenues include the operation and maintenance funds appropriated directly to the shipyard and the conversion and procurement money appropriated to NAVSEA. For working-capital-funded shipyards, revenues include the funds obligated by the shipyard's customers, also sorted by appropriation. Costs are listed by major category, including direct labor, direct materials, contract, and overhead costs. Any other important categories could also be listed separately. Overhead would be defined consistently among shipyards to include costs for all base operating support; indirect labor, materials, contracts, and travel; support services (such as the Defense Finance and Accounting Service or the Defense Information Systems Agency); and headquarters support. The table also shows net and accumulated operating results (applicable only to WCF shipyards), which indicate whether a shipyard's rates are too high or too low compared with its costs.

The fourth and fifth sections list capital and military construction expenses, which provide a measure of the amount that a shipyard is spending to replace or upgrade its equipment and physical plant. Comparing annual expenses with the total value of capital and facilities would allow lawmakers to roughly gauge the reasonableness of those expenses. For example, if capital has an average life of 20 years, annual capital expenditures should be about 5 percent of the total value of capital and facilities.

The sixth and seventh sections list the number of shipyard employees, the number of days worked, and the shipyard's labor rates. The purpose of those sections is to give the Congress the information necessary to assess a shipyard's performance. The ratio of direct to indirect labor-days reveals the administrative efficiency of the shipyard. Its labor rates indicate how well the shipyard is controlling costs and enable comparisons between Navy and private maintenance facilities. The current burdened rate is total costs divided by direct labor-days. The Navy reimbursable rate is the rate that shipyards charge NAVSEA, which currently includes only direct labor and materials costs. The non-Navy reimbursable rate (still under consideration by the Navy) would also include some overhead and would equal the fully burdened rate if all overhead and indirect expenses were incorporated. The WCF rate is similar to the fully burdened

Table 4.**Operations Summary for the Norfolk Naval Shipyard**

(In the dollars of each fiscal year)

	Actual					Projected	
	2001	2002	2003	2004	2005	2006 ^a	2007 2008
Revenue (Millions of dollars)							
Operation and Maintenance							
Atlantic Fleet	NYA	NYA	NYA	NYA	NYA		
Pacific Fleet	NYA	NYA	NYA	NYA	NYA		
NAVSEA	NYA	NYA	NYA	NYA	NYA		
Navy Procurement	NYA	NYA	NYA	NYA	NYA		
Navy Shipbuilding and							
Conversion	NYA	NYA	NYA	NYA	NYA		
Other Department of Navy	NYA	NYA	NYA	NYA	NYA		
Other Department of Defense	NYA	NYA	NYA	NYA	NYA		
Foreign Military Sales	NYA	NYA	NYA	NYA	NYA		
Other Federal Government	NYA	NYA	NYA	NYA	NYA		
Other ^b	NYA	NYA	NYA	NYA	NYA		
Total	NYA	NYA	NYA	NYA	NYA		
Costs (Millions of dollars)^c							
Direct Military Labor	0	0	0	0	0		
Direct Civilian Labor	276.6	335.7	346.7	419.5	408.0		
Direct Materials	81.1	108.2	102.2	100.0	82.1		
Direct Contract	169.2	164.2	185.5	272.7	138.8		
Other Direct Costs ^d	NYA	NYA	NYA	NYA	NYA		
Overhead ^e	293.0	338.1	344.3	337.1	333.8		
Total	828.0	957.9	994.9	1,139.5	988.0		
WCF Operating Results (Millions of dollars)							
Net Operating Result	-17.3	19.5	67.3	-28.1	8.0		
Accumulated Operating Result	-6.9	-22.0	34.8	5.3	12.9		
End of Fiscal Year Carryover	NYA	NYA	NYA	NYA	NYA		
Capital (Millions of dollars)							
Capital Expenditure	15.6	32.9	16.3	15.8	21.1		
Capital Depreciation	NYA	NYA	NYA	NYA	NYA		
Capital Replacement Value	211	221	208	210	NYA		
Facilities (Millions of dollars)							
Military Construction	0	14.8	36.5	17.8	0		
Base Operating Support	NYA	NYA	NYA	NYA	NYA		
Facilities Replacement Value	NYA	NYA	NYA	NYA	1,095		
Labor							
Military End Strength	51	51	51	43	43		
Civilian End Strength	6,809	7,425	7,667	7,778	7,679		
Direct Military Labor-Days	0	0	0	0	0		
Indirect Military Labor-Days	12,873	12,750	11,679	10,621	10,793		
Direct Civilian Labor-Days	1,084,816	1,254,766	1,236,735	1,430,143	1,316,920		
Indirect Civilian Labor-Days	521,802	559,364	581,696	520,930	558,319		

Continued

Table 4.**Continued**

	Actual					Projected		
	2001	2002	2003	2004	2005	2006 ^a	2007	2008
Rates (Dollars)								
Current Burdened Rate ^f	763	763	804	797	750			
Navy Reimbursable Rate	NYA	NYA	NYA	NYA	NYA			
Non-Navy Reimbursable Rate	NYA	NYA	NYA	NYA	NYA			
Working Capital Fund Rate	516	589	589	505	602			
Hulls Completed This Fiscal Year								
Number	5	9	8	4	4			
Budgeted Labor-Days	451,820	702,075	847,136	417,859	569,146			
Actual Labor-Days	424,100	716,900	845,700	414,100	540,800			
Ratio of Actual Labor-Days to Budgeted Labor-Days	0.94	1.02	1.00	0.99	0.95			
Scheduled Weeks	159	392	267	134	122			
Actual Weeks	159	332	267	134	122			
Average Percentage Late ^g	0	2.0	0	0	0			
Maximum Percentage Late	0	11.4	0.2	0	0			
Average Labor Cost per Hull (Millions of dollars)	47	46	99	97	116			
Hulls in Progress at End of Fiscal Year								
Number	NYA	NYA	NYA	NYA	NYA			
Budgeted Labor-Days Remaining	NYA	NYA	NYA	NYA	NYA			
Percentage of Work Remaining	NYA	NYA	NYA	NYA	NYA			

Source: Congressional Budget Office.

Notes: This table is intended to serve as a template that shipyards could use in reporting to the Congress. As such, it includes space for data from the current fiscal year, five years of past data, and two years of projected data to provide historical context and show potential trends. Additional detail and backup information should be available, in a standard format, for all categories. Similar reports for intermediate-level maintenance facilities may be useful.

NYA = not yet available; NAVSEA = Naval Sea Systems Command; WCF = working-capital funding.

- a. The current fiscal year.
- b. The categories included in other revenue should be defined.
- c. The totals in this section do not match the sums of the categories (all of which were provided separately by the Navy) because they include some costs not in the individual categories.
- d. Other direct costs include travel and transportation related to a specific repair.
- e. Overhead should include costs for base operating support; indirect labor, materials, contracts, and travel; training; support services (such as the Defense Finance and Accounting Service); and headquarters support (NAVSEA).
- f. Equals total costs divided by direct labor-days. Capital depreciation is included in WCF rates, but capital expenditure is not included in the current burdened rate. Direct material expense is included in the current burdened rate but not in WCF rates. The table should also provide a definition or reference for other rates.
- g. Early completions count as zero percent late.

rate but does not include direct materials costs, is set 18 to 24 months in advance, and incorporates past profits or losses.

The last two sections of the table show performance and schedule metrics based on hulls (ship availabilities) completed and in progress. Those sections illustrate how well a shipyard meets productivity and schedule expectations. A ratio of actual to budgeted labor-days greater than 1 indicates that the shipyard took longer to perform its work than anticipated. The budgeted number of labor-days remaining for hulls in progress denotes how much work carries over to the next fiscal year. Further detail may be needed in that section because there are wide variances between types of ships (such as aircraft carriers or submarines) and between maintenance actions (such as refueling or conversion).

Appendix

As described in the main text, the Congressional Budget Office (CBO) has developed a summary table that might serve as a model for naval shipyards' reporting to the Congress. The table includes various measures of cost and performance that could improve lawmakers' understanding and oversight of shipyard operations. Tables A-1 to A-3 in this appendix apply that model to the Portsmouth, Puget Sound, and Pearl Harbor Naval Shipyards. (A version for the Norfolk Naval Shipyard appears as Table 4 on page 20.) Table A-4 is an aggregate table covering all four of the Navy's shipyards.

The numbers in the tables come from the Navy. Some data for the past five fiscal years and the current year are not yet available to CBO. In addition, the tables include space for two years of projections to show possible trends.

Table A-1.**Operations Summary for the Portsmouth Naval Shipyard**

(In the dollars of each fiscal year)

	Actual					Projected	
	2001	2002	2003	2004	2005	2006 ^a	2007 2008
Revenue (Millions of dollars)							
Operation and Maintenance							
Atlantic Fleet	NYA	NYA	NYA	NYA	NYA		
Pacific Fleet	NYA	NYA	NYA	NYA	NYA		
NAVSEA	NYA	NYA	NYA	NYA	NYA		
Navy Procurement	NYA	NYA	NYA	NYA	NYA		
Navy Shipbuilding and							
Conversion	NYA	NYA	NYA	NYA	NYA		
Other Department of Navy	NYA	NYA	NYA	NYA	NYA		
Other Department of Defense	NYA	NYA	NYA	NYA	NYA		
Foreign Military Sales	NYA	NYA	NYA	NYA	NYA		
Other Federal Government	NYA	NYA	NYA	NYA	NYA		
Other ^b	NYA	NYA	NYA	NYA	NYA		
Total	NYA	NYA	NYA	NYA	NYA		
Costs (Millions of dollars)^c							
Direct Military Labor	0	0	0	0	0		
Direct Civilian Labor	141.3	170.0	180.5	212.8	226.3		
Direct Materials	31.7	36.1	35.9	39.8	44.9		
Direct Contract	108.2	125.2	147.8	165.8	128.4		
Other Direct Costs ^d	NYA	NYA	NYA	NYA	NYA		
Overhead ^e	173.3	189.0	192.9	193.2	193.5		
Total	458.9	524.8	565.1	620.8	599.5		
WCF Operating Results (Millions of dollars)							
Net Operating Result	-1.0	14.8	25.8	-10.1	-29.3		
Accumulated Operating Result	1.7	10.2	35.3	25.3	-4.1		
End of Fiscal Year Carryover	NYA	NYA	NYA	NYA	NYA		
Capital (Millions of dollars)							
Capital Expenditure	31.4	77.5	15.5	5.4	3.5		
Capital Depreciation	NYA	NYA	NYA	NYA	NYA		
Capital Replacement Value	164	166	173	166	NYA		
Facilities (Millions of dollars)							
Military Construction	5.0	14.6	15.2	0	0		
Base Operating Support	NYA	NYA	NYA	NYA	NYA		
Facilities Replacement Value	NYA	NYA	NYA	NYA	484		
Labor							
Military End Strength	36	36	34	36	30		
Civilian End Strength	3,548	3,680	3,819	3,925	3,958		
Direct Military Labor-Days	0	0	0	0	0		
Indirect Military Labor-Days	9,248	9,789	8,962	7,776	7,584		
Direct Civilian Labor-Days	516,040	588,819	601,913	671,435	694,686		
Indirect Civilian Labor-Days	297,760	285,241	301,067	290,829	287,652		

Continued

Table A-1.**Continued**

	Actual					Projected		
	2001	2002	2003	2004	2005	2006 ^a	2007	2008
Rates (Dollars)								
Current Burdened Rate ^f	863	891	939	925	863			
Navy Reimbursable Rate	NYA	NYA	NYA	NYA	NYA			
Non-Navy Reimbursable Rate	NYA	NYA	NYA	NYA	NYA			
Working Capital Fund Rate	615	660	640	527.0	572.0			
Hulls Completed This Fiscal Year								
Number	4	2	5	4	2			
Budgeted Labor-Days	514,482	488,915	567,693	572,634	447,073			
Actual Labor-Days	552,300	488,800	561,600	554,900	439,800			
Ratio of Actual Labor-Days to Budgeted Labor-Days	1.07	1.00	0.99	0.97	0.98			
Scheduled Weeks	204	157	213	204	149			
Actual Weeks	205	157	213	204	143			
Average Percentage Late ^g	3.7	0	0.2	0	0			
Maximum Percentage Late	14.8	0	0.9	0	0			
Average Labor Cost per Hull (Millions of dollars)	98	182	82	107	169			
Hulls in Progress at End of Fiscal Year								
Number	NYA	NYA	NYA	NYA	NYA			
Budgeted Labor-Days Remaining	NYA	NYA	NYA	NYA	NYA			
Percentage of Work Remaining	NYA	NYA	NYA	NYA	NYA			

Source: Congressional Budget Office.

Notes: This table is intended to serve as a template that shipyards could use in reporting to the Congress. As such, it includes space for data from the current fiscal year, five years of past data, and two years of projected data to provide historical context and show potential trends. Additional detail and backup information should be available, in a standard format, for all categories. Similar reports for intermediate-level maintenance facilities may be useful.

NYA = not yet available; NAVSEA = Naval Sea Systems Command; WCF = working-capital funding.

- a. The current fiscal year.
- b. The categories included in other revenue should be defined.
- c. The totals in this section do not match the sums of the categories (all of which were provided separately by the Navy) because they include some costs not in the individual categories.
- d. Other direct costs include travel and transportation related to a specific repair.
- e. Overhead should include costs for base operating support; indirect labor, materials, contracts, and travel; training; support services (such as the Defense Finance and Accounting Service); and headquarters support (NAVSEA).
- f. Equals total costs divided by direct labor-days. Capital depreciation is included in WCF rates, but capital expenditure is not included in the current burdened rate. Direct material expense is included in the current burdened rate but not in WCF rates. The table should also provide a definition or reference for other rates.
- g. Early completions count as zero percent late.

Table A-2.**Operations Summary for the Puget Sound Naval Shipyard**

(In the dollars of each fiscal year)

	Actual					Projected		
	2001	2002	2003	2004	2005	2006 ^a	2007	2008
Revenue (Millions of dollars)								
Operation and Maintenance								
Atlantic Fleet	NYA	NYA	NYA	NYA	NYA			
Pacific Fleet	NYA	NYA	NYA	NYA	NYA			
NAVSEA	NYA	NYA	NYA	NYA	NYA			
Navy Procurement	NYA	NYA	NYA	NYA	NYA			
Navy Shipbuilding and								
Conversion	NYA	NYA	NYA	NYA	NYA			
Other Department of Navy	NYA	NYA	NYA	NYA	NYA			
Other Department of Defense	NYA	NYA	NYA	NYA	NYA			
Foreign Military Sales	NYA	NYA	NYA	NYA	NYA			
Other Federal Government	NYA	NYA	NYA	NYA	NYA			
Other ^b	NYA	NYA	NYA	NYA	NYA			
Total	NYA	NYA	NYA	NYA	NYA			
Costs (Millions of dollars)^c								
Direct Military Labor	0	0	0	3.9	4.9			
Direct Civilian Labor	390.2	475.4	467.8	485.9	495.3			
Direct Materials	66.3	79.2	78.8	144.8	95.8			
Direct Contract	73.2	103.7	139.5	68.0	101.2			
Other Direct Costs ^d	NYA	NYA	NYA	NYA	NYA			
Overhead ^e	327.4	346.3	356.7	258.0	304.3			
Total	874.8	1,029.2	1,064.5	1,060.2	1,077.7			
WCF Operating Results (Millions of dollars)								
Net Operating Result	11.2	9.8	-9.0	n.a.	n.a.			
Accumulated Operating Result	11.8	-9.5	-24.6	n.a.	n.a.			
End of Fiscal Year Carryover	NYA	NYA	NYA	n.a.	n.a.			
Capital (Millions of dollars)								
Capital Expenditure	14.3	16.6	10.7	22.5	9.5			
Capital Depreciation	NYA	NYA	NYA	n.a.	n.a.			
Capital Replacement Value	178	NYA	NYA	NYA	NYA			
Facilities (Millions of dollars)								
Military Construction	26.0	14.0	57.1	6.0	20.3			
Base Operating Support	NYA	NYA	NYA	NYA	NYA			
Facilities Replacement Value	NYA	NYA	NYA	NYA	1,971			
Labor								
Military End Strength	25	25	26	81	82			
Civilian End Strength	8,079	8,445	8,428	8,642	9,092			
Direct Military Labor-Days	0	0	0	4,489	4,489			
Indirect Military Labor-Days	6,922	6,764	6,854	4,601	4,714			
Direct Civilian Labor-Days	1,323,237	1,532,929	1,453,381	1,467,807	1,495,044			
Indirect Civilian Labor-Days	527,676	553,609	565,322	542,455	531,722			

Continued

Table A-2.**Continued**

	Actual					Projected		
	2001	2002	2003	2004	2005	2006 ^a	2007	2008
Rates (Dollars)								
Current Burdened Rate ^f	661	671	732	720	719			
Navy Reimbursable Rate	NYA	NYA	NYA	NYA	NYA			
Non-Navy Reimbursable Rate	NYA	NYA	NYA	NYA	NYA			
Working Capital Fund Rate	572	554	573	n.a.	n.a.			
Hulls Completed This Fiscal Year								
Number	5	17	8	8	3			
Budgeted Labor-Days	376,833	1,739,958	582,860	1,432,451	106,449			
Actual Labor-Days	377,300	1,461,385	515,500	1,319,073	103,700			
Ratio of Actual Labor-Days to Budgeted Labor-Days	1.00	0.84	0.88	0.92	0.97			
Scheduled Weeks	338	941	395	530	242			
Actual Weeks	337	942	393	531	242			
Average Percentage Late ^g	0	0.7	3.1	0.1	0.2			
Maximum Percentage Late	0	7.9	23.7	0.6	0.5			
Average Labor Cost per Hull (Millions of dollars)	28	45	31	128	19			
Hulls in Progress at End of Fiscal Year								
Number	NYA	NYA	NYA	NYA	NYA			
Budgeted Labor-Days Remaining	NYA	NYA	NYA	NYA	NYA			
Percentage of Work Remaining	NYA	NYA	NYA	NYA	NYA			

Source: Congressional Budget Office.

Notes: This table is intended to serve as a template that shipyards could use in reporting to the Congress. As such, it includes space for data from the current fiscal year, five years of past data, and two years of projected data to provide historical context and show potential trends. Additional detail and backup information should be available, in a standard format, for all categories. Similar reports for intermediate-level maintenance facilities may be useful.

NYA = not yet available; NAVSEA = Naval Sea Systems Command; WCF = working-capital funding; n.a. = not applicable.

- a. The current fiscal year.
- b. The categories included in other revenue should be defined.
- c. The totals in this section do not match the sums of the categories (all of which were provided separately by the Navy) because they include some costs not in the individual categories.
- d. Other direct costs include travel and transportation related to a specific repair.
- e. Overhead should include costs for base operating support; indirect labor, materials, contracts, and travel; training; support services (such as the Defense Finance and Accounting Service); and headquarters support (NAVSEA). Mission-funded yards do not now include all those categories.
- f. Equals total costs divided by direct labor-days. Capital depreciation is included in WCF rates, but capital expenditure is not included in the current burdened rate. Direct material expense is included in the current burdened rate but not in WCF rates. The table should also provide a definition or reference for other rates.
- g. Early completions count as zero percent late.

Table A-3.**Operations Summary for the Pearl Harbor Naval Shipyard**

(In the dollars of each fiscal year)

	Actual					Projected		
	2001	2002	2003	2004	2005	2006 ^a	2007	2008
Revenue (Millions of dollars)								
Operation and Maintenance								
Atlantic Fleet	NYA	NYA	NYA	NYA	NYA			
Pacific Fleet	NYA	NYA	NYA	NYA	NYA			
NAVSEA	NYA	NYA	NYA	NYA	NYA			
Navy Procurement	NYA	NYA	NYA	NYA	NYA			
Navy Shipbuilding and								
Conversion	NYA	NYA	NYA	NYA	NYA			
Other Department of Navy	NYA	NYA	NYA	NYA	NYA			
Other Department of Defense	NYA	NYA	NYA	NYA	NYA			
Foreign Military Sales	NYA	NYA	NYA	NYA	NYA			
Other Federal Government	NYA	NYA	NYA	NYA	NYA			
Other ^b	NYA	NYA	NYA	NYA	NYA			
Total	NYA	NYA	NYA	NYA	NYA			
Costs (Millions of dollars)^c								
Direct Military Labor	15.1	16.5	21.7	28.8	31.1			
Direct Civilian Labor	110.7	125.0	145.2	157.0	176.8			
Direct Materials	32.5	24.2	29.4	29.6	39.6			
Direct Contract	31.1	36.0	23.6	23.3	39.5			
Other Direct Costs ^d	NYA	NYA	NYA	NYA	NYA			
Overhead ^e	<u>121.3</u>	<u>146.9</u>	<u>172.2</u>	<u>155.9</u>	<u>169.6</u>			
Total	306.5	337.8	371.2	374.3	439.3			
WCF Operating Results (Millions of dollars)								
Net Operating Result	n.a.	n.a.	n.a.	n.a.	n.a.			
Accumulated Operating Result	n.a.	n.a.	n.a.	n.a.	n.a.			
End of Fiscal Year Carryover	n.a.	n.a.	n.a.	n.a.	n.a.			
Capital (Millions of dollars)								
Capital Expenditure	19.9	23.2	24.2	16.1	9.0			
Capital Depreciation	n.a.	n.a.	n.a.	n.a.	n.a.			
Capital Replacement Value	NYA	NYA	NYA	NYA	NYA			
Facilities (Millions of dollars)								
Military Construction	0	20.0	18.5	7.0	5.1			
Base Operating Support	NYA	NYA	NYA	NYA	NYA			
Facilities Replacement Value	NYA	NYA	NYA	NYA	1,373			
Labor								
Military End Strength ^f	607	641	684	758	757			
Civilian End Strength ^f	3,742	3,985	4,072	4,330	4,302			
Direct Military Labor-Days	17,312	18,391	22,273	22,586	24,782			
Indirect Military Labor-Days	48,384	46,254	52,275	70,253	71,150			
Direct Civilian Labor-Days	365,798	381,842	401,032	441,782	476,373			
Indirect Civilian Labor-Days	279,544	270,016	244,578	292,011	303,400			

Continued

Table A-3.**Continued**

	Actual					Projected		
	2001	2002	2003	2004	2005	2006 ^a	2007	2008
Rates (Dollars)								
Current Burdened Rate ^g	800	844	877	806	876			
Navy Reimbursable Rate	NYA	NYA	NYA	NYA	NYA			
Non-Navy Reimbursable Rate	NYA	NYA	NYA	NYA	NYA			
Working Capital Fund Rate	n.a.	n.a.	n.a.	n.a.	n.a.			
Hulls Completed This Fiscal Year								
Number	8	6	3	2	3			
Budgeted Labor-Days	338,851	309,128	94,289	94,957	529,770			
Actual Labor-Days	353,600	255,200	100,000	63,100	536,400			
Ratio of Actual Labor-Days to Budgeted Labor-Days	1.04	0.83	1.06	0.67	1.01			
Scheduled Weeks	153	123	43	49	182			
Actual Weeks	152	129	45	49	187			
Average Percentage Late ^h	0	6.3	5.0	0.3	4.3			
Maximum Percentage Late	0	23.4	14.9	0.5	12.8			
Average Labor Cost per Hull (Millions of dollars)	13	13	11	13	68			
Hulls in Progress at End of Fiscal Year								
Number	NYA	NYA	NYA	NYA	NYA			
Budgeted Labor-Days Remaining	NYA	NYA	NYA	NYA	NYA			
Percentage of Work Remaining	NYA	NYA	NYA	NYA	NYA			

Source: Congressional Budget Office.

Notes: This table is intended to serve as a template that shipyards could use in reporting to the Congress. As such, it includes space for data from the current fiscal year, five years of past data, and two years of projected data to provide historical context and show potential trends. Additional detail and backup information should be available, in a standard format, for all categories. Similar reports for intermediate-level maintenance facilities may be useful.

NYA = not yet available; NAVSEA = Naval Sea Systems Command; WCF = working-capital funding; n.a. = not applicable.

- a. The current fiscal year.
- b. The categories included in other revenue should be defined.
- c. The totals in this section do not match the sums of the categories (all of which were provided separately by the Navy) because they include some costs not in the individual categories.
- d. Other direct costs include travel and transportation related to a specific repair.
- e. Overhead should include costs for base operating support; indirect labor, materials, contracts, and travel; training; support services (such as the Defense Finance and Accounting Service); and headquarters support (NAVSEA). Mission-funded yards do not now include all those categories.
- f. Equals total costs divided by direct labor-days. Capital depreciation is included in WCF rates, but capital expenditure is not included in the current burdened rate. Direct material expense is included in the current burdened rate but not in WCF rates. The table should also provide a definition or reference for other rates.
- g. Early completions count as zero percent late.

Table A-4.**Operations Summary for All Naval Shipyards**

(In the dollars of each fiscal year)

	Actual					Projected		
	2001	2002	2003	2004	2005	2006 ^a	2007	2008
Revenue (Millions of dollars)								
Operation and Maintenance								
Atlantic Fleet	NYA	NYA	NYA	NYA	NYA			
Pacific Fleet	NYA	NYA	NYA	NYA	NYA			
NAVSEA	NYA	NYA	NYA	NYA	NYA			
Navy Procurement	NYA	NYA	NYA	NYA	NYA			
Navy Shipbuilding and								
Conversion	NYA	NYA	NYA	NYA	NYA			
Other Department of Navy	NYA	NYA	NYA	NYA	NYA			
Other Department of Defense	NYA	NYA	NYA	NYA	NYA			
Foreign Military Sales	NYA	NYA	NYA	NYA	NYA			
Other Federal Government	NYA	NYA	NYA	NYA	NYA			
Other ^b	NYA	NYA	NYA	NYA	NYA			
Total	NYA	NYA	NYA	NYA	NYA			
Costs (Millions of dollars)^c								
Direct Military Labor	15.1	16.5	21.7	32.7	36.0			
Direct Civilian Labor	918.7	1,106.1	1,140.2	1,275.2	1,306.4			
Direct Materials	211.6	247.7	246.3	314.2	262.4			
Direct Contract	381.7	429.1	496.4	529.8	407.9			
Other Direct Costs ^d	NYA	NYA	NYA	NYA	NYA			
Overhead ^e	915.0	1,020.3	1,066.1	944.2	1,001.2			
Total	2,468.2	2,849.7	2,995.7	3,194.8	3,104.5			
WCF Operating Results (Millions of dollars)								
Net Operating Result	n.a.	n.a.	n.a.	n.a.	n.a.			
Accumulated Operating Result	n.a.	n.a.	n.a.	n.a.	n.a.			
End of Fiscal Year Carryover	n.a.	n.a.	n.a.	n.a.	n.a.			
Capital (Millions of dollars)								
Capital Expenditure	81.2	150.2	66.7	59.8	43.1			
Capital Depreciation	n.a.	n.a.	n.a.	n.a.	n.a.			
Capital Replacement Value	553.0	387.0	381.0	376.0	NYA			
Facilities (Millions of dollars)								
Military Construction	31.0	63.4	127.3	30.8	25.4			
Base Operating Support	NYA	NYA	NYA	NYA	NYA			
Facilities Replacement Value	NYA	NYA	NYA	NYA	4,984			
Labor								
Military End Strength	719	753	795	918	912			
Civilian End Strength	22,178	23,535	23,986	24,675	25,031			
Direct Military Labor-Days	17,312	18,391	22,273	27,075	29,271			
Indirect Military Labor-Days	77,427	75,557	79,770	93,251	94,241			
Direct Civilian Labor-Days	3,289,891	3,758,356	3,693,061	4,011,167	3,983,023			
Indirect Civilian Labor-Days	1,626,782	1,668,230	1,692,663	1,646,225	1,681,093			

Continued

Table A-4.**Continued**

	Actual					Projected		
	2001	2002	2003	2004	2005	2006 ^a	2007	2008
Rates (Dollars)								
Current Burdened Rate ^f	746	755	806	791	774			
Navy Reimbursable Rate	NYA	NYA	NYA	NYA	NYA			
Non-Navy Reimbursable Rate	NYA	NYA	NYA	NYA	NYA			
Working Capital Fund Rate	n.a.	n.a.	n.a.	n.a.	n.a.			
Hulls Completed This Fiscal Year								
Number	22	34	24	18	12			
Budgeted Labor-Days	1,681,986	3,240,076	2,091,978	2,517,901	1,652,438			
Actual Labor-Days	1,707,300	2,922,285	2,022,800	2,351,173	1,620,700			
Ratio of Actual Labor-Days to Budgeted Labor-Days	1.02	0.90	0.97	0.93	0.98			
Scheduled Weeks	854	1,614	918	917	695			
Actual Weeks	853	1,560	918	918	694			
Average Percentage Late ^g	NYA	NYA	NYA	NYA	NYA			
Maximum Percentage Late	NYA	NYA	NYA	NYA	NYA			
Average Labor Cost per Hull (Millions of dollars)	NYA	NYA	NYA	NYA	NYA			
Hulls in Progress at End of Fiscal Year								
Number	NYA	NYA	NYA	NYA	NYA			
Budgeted Labor-Days Remaining	NYA	NYA	NYA	NYA	NYA			
Percentage of Work Remaining	NYA	NYA	NYA	NYA	NYA			

Source: Congressional Budget Office.

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- f. Equals total costs divided by direct labor-days. Capital depreciation is included in WCF rates, but capital expenditure is not included in the current burdened rate. Direct material expense is included in the current burdened rate but not in WCF rates. The table should also provide a definition or reference for other rates.
- g. Early completions count as zero percent late.