CBO TESTIMONY

Statement of
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before the
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NOTICE

This statement is not available for public release until it is delivered at 9:30 a.m. (EDT), Friday, June 14, 1991.

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I appreciate the opportunity to testify today about the Navy's budgetary requirements, particularly its long-term requirements. There is, of course, great uncertainty about the nature of future threats to U.S. security, and hence about the size and nature of the Navy that this country will require. There is also great uncertainty about how much money will be available to buy and operate Navy ships and aircraft, particularly in the years beyond 1995.

In the face of these major uncertainties, this testimony considers a wide range of possible naval forces, including the Administration's planned forces as well as alternatives that vary in their emphasis on key Navy missions. The testimony concentrates on the issue of long-term affordability, though it also discusses the effectiveness of alternative naval forces. Ships are the focus of the discussion, but the testimony also considers naval aviation.

CBO's analysis reaches several broad conclusions:

- Though the Navy's real budget levels would decline through 1995 under the Administration plan, in the 15 years after 1995 budgets would have to increase by between about 1 percent and 3 percent a year to maintain the Administration's planned

forces, leaving the total budget in 2010 higher by between $11 billion and $55 billion than in 1995;

o The wide range of cost increases primarily reflects uncertainty about the future cost of weapons, with the higher estimates being most consistent with past experience; and

o If Navy budgets beyond 1995 were kept constant in real terms, the service might be forced to reduce its fleet from the planned 1995 level of about 450 ships to no more than 310 ships (including 9 aircraft carriers) and to equip the carriers with only a small number of the most capable aircraft.

THE ADMINISTRATION'S PLANNED FORCES

Under the Administration plan, the Navy would have fewer ships and aircraft in future years than it has today, a trend that would affect both budgets and capability.

Description of the Forces

By 1995, the Navy would have 451 battle force ships under the Administration plan, about 15 percent fewer than it had at the end of 1991 (see Table 1 and Figure 1). The total number of aircraft carriers-including carriers that would be undergoing a service life extension or nuclear refueling and therefore would not be available on short notice--would decline from 15 in 1991 to 12 in 1995, while the air wings associated with the carriers would fall from 14 (down from 15 in 1990) to 13. The 1995 fleet would include about 90 attack submarines.

Beyond 1995, complete details about the Administration's plan for the Navy are not publicly available. The Navy has, however, discussed plans for its most important forces. For example, the Navy has said that it seeks to maintain 12 aircraft carriers, 13 air wings, 80 attack submarines, 18 submarines that carry strategic ballistic missiles, 150 surface combatants (cruisers, destroyers, and frigates), and enough amphibious warfare ships to transport the personnel and equipment associated with two and one-half Marine Expeditionary Brigades (about 34,000 Marines). CBO assumes that other naval forces would be maintained in numbers consistent with these planned forces or with the Navy's most recently stated plans.

TABLE 1. NUMBERS OF SHIPS AND AIR WINGS UNDER VARIOUS OPTIONS

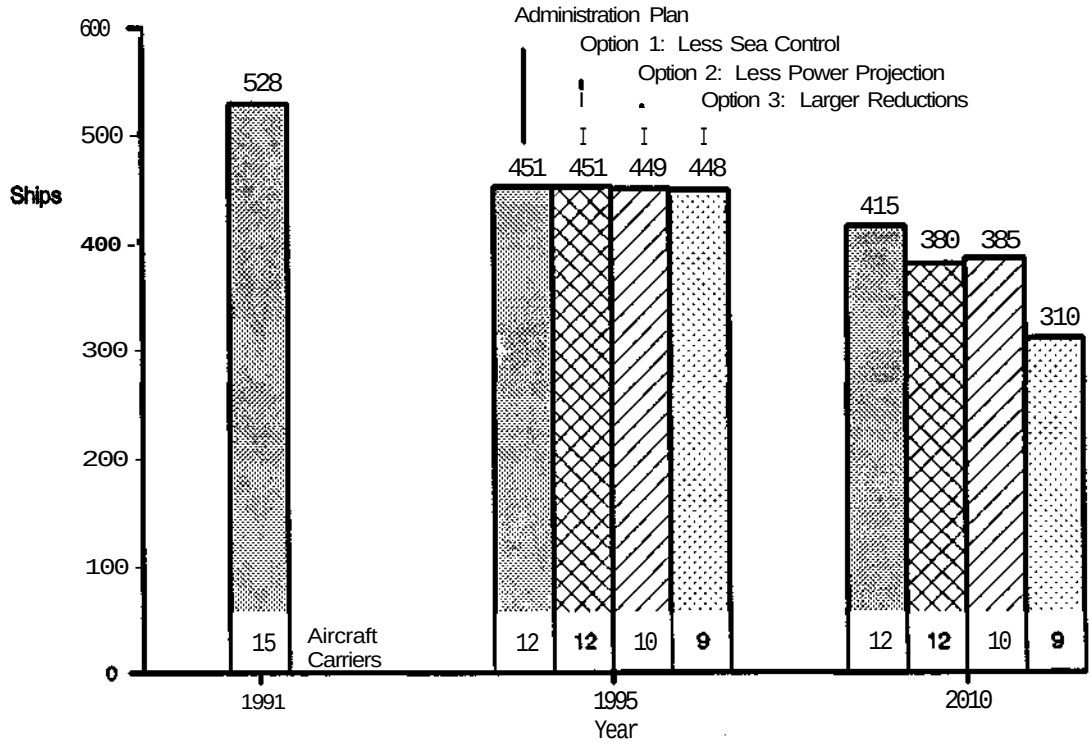
End of Fiscal Year	Type of Force	Options: Administration Forces[a]	I Less Sea Control	II Less Power Projection	III Larger Reductions
1991	Total Ships	528	528	528	528
	Aircraft Carriers[b]	15	15	15	15
	Air Wings	14	14	14	14
	Attack Submarines	87	87	87	87
1995	Total Ships	451	451	449	448
	Aircraft Carriers[b]	12	12	10	9
	Air Wings	13	13	11	10
	Attack Submarines	90	90	90	90
2010	Total Ships	415	380	385	310
	Aircraft Carriers[b]	12	12	10	9
	Air Wings	13	13	11	10
	Attack Submarines	80	45	80	45

SOURCE: Congressional Budget Office.

a. For 1991 and 1995, CBO used Administration force levels. For 2010, CBO assumed forces that, combined with projected retirements and other assumptions, would maintain 12 aircraft carriers, 80 attack submarines, 150 surface combatants, 18 strategic ballistic missile submarines, 13 carrier air wings, 4 Marine Corps air wings, and the Administration's forces of land-based maritime patrol aircraft.

b. Total number of aircraft carriers, including carriers that are undergoing a service life extension or nuclear refueling. Carriers undergoing a service life extension or nuclear refueling would be disassembled to such a degree that they could deploy only after many months of preparation. Between zero and three carriers would be undergoing a service life extension or nuclear refueling at any one time.

Figure 1.
Numbers of Ships Under Options



SOURCE Congressional Budget Office

These statements suggest that the total size of the Administration's planned Navy would continue to decline in the years beyond 1995, perhaps falling to a level of about 415 ships by 2010. The decline would occur because some new types of vessels--such as ballistic missile submarines, destroyers, and some amphibious vessels--would not replace older ships on a one-for-one basis.

To support this fleet, the Navy plans to buy an average of 8.8 ships and 110 combat aircraft a year between 1992 and 1995. Between 1996 and the end of the next decade, the Navy would have to buy an annual average of 10.6 ships and 167 combat aircraft to maintain the Administration's planned forces. These annual buys are determined by the desired size of naval forces and by planned retirements. (Tables A-1 and A-2 in the appendix to this testimony present more information about weapons purchases and retirement ages.)

One aspect of the Administration's plan remains unclear, even for the years between 1992 and 1995. The Administration has indicated that, because of needs that became apparent during Operation Desert Storm, it is considering increasing its capability to transport military weapons and supplies to crisis areas and its pre-positioning of weapons and supplies near areas of likely conflicts. However, the Administration has not yet submitted a detailed

plan for buying more sealift or pre-positioning capability. After that plan has been submitted and approved, there could be increases in the costs of the sealift portions of the Administration plan. These added costs may be offset by reductions in other parts of the Navy's budget, and in any event they are unlikely to alter significantly the budgetary trends discussed in this testimony.[1]

Fleet Capability

The decline in the numbers of ships and aircraft under the Administration plan suggests a reduction in naval capability, but trends in numbers of weapons and other measures tell a different story.

Decline in Numbers of Ships. The decline in numbers of ships under the Administration plan, and particularly the reduction in aircraft carriers, could lengthen the time required to respond to international crises. The decline under the Administration's plan from 15 carriers in 1991 to 12 carriers in 1995 would probably reduce the average number of carriers deployed overseas in peacetime. If a crisis occurred somewhere in the world with little notice, and enough carriers were not already deployed overseas to handle the problem, there would be a significant delay before naval forces could be available. It

1. For further discussion of sealift costs, see the statement of Robert Reischauer before the Committee on the Budget, U.S. House of Representatives, February 27, 1991, p.16.

takes a carrier based on the East Coast of the United States about 15 days to reach the Persian Gulf. Several additional weeks could be required if the East Coast carrier was not ready to sail. Delays would probably be shorter but still significant if the crisis occurred somewhere other than the Persian Gulf.

With fewer ships, the Administration's planned fleet would also have less capability in a major war. This reduction in capability would be most worrisome in a war involving the Soviet Union, which has the ships and personnel to mount a major naval attack.

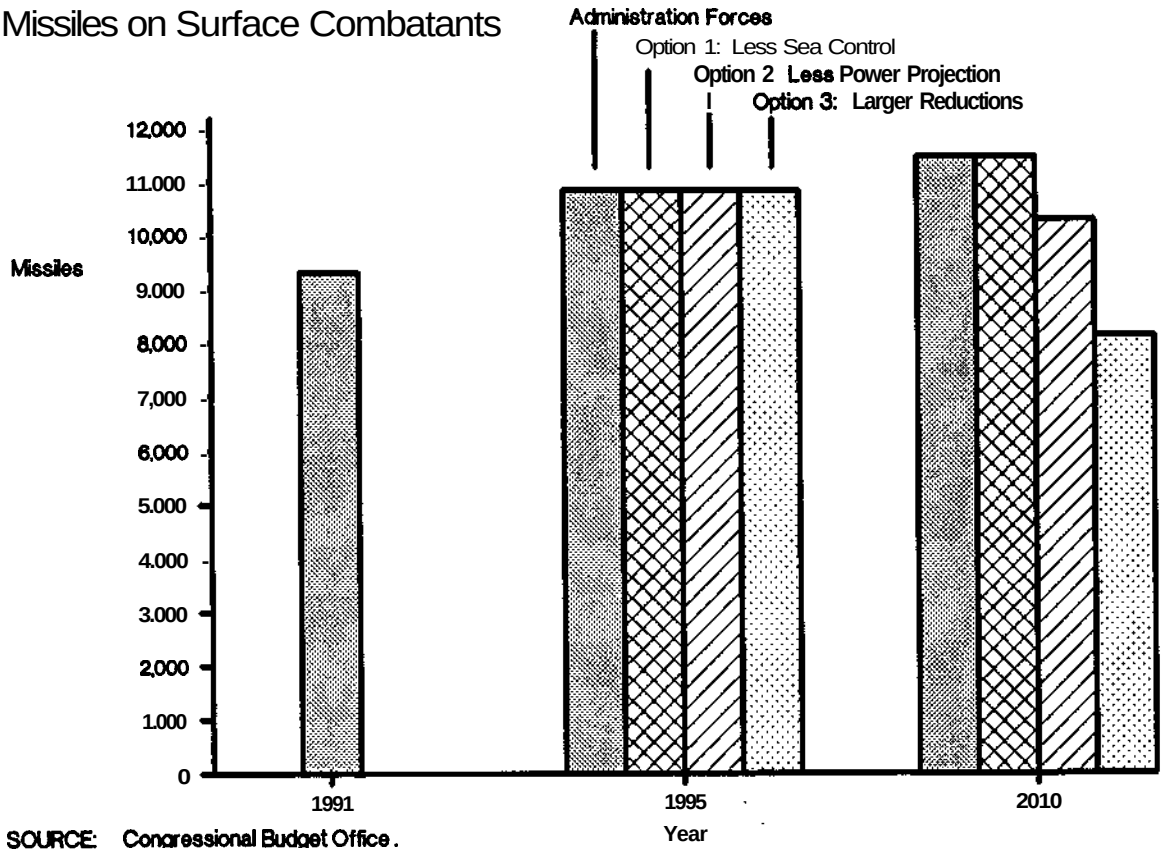
On the other hand, recent political events have greatly reduced the chance of a major war with the Soviet Union. Lesser conflicts seem much more likely. At least for lesser conflicts of the sort that have occurred since World War II, a Navy of between 400 ships and 450 ships and 12 aircraft carriers would probably be adequate to carry out U.S. policy. For example, the Navy deployed as many as six aircraft carriers and a total of about 100 ships to the Persian Gulf and surrounding seas during Operation Desert Storm. The smaller fleet planned by the Administration could probably have sustained that deployment, though very likely with a good deal of strain and perhaps only for a limited period of time.

Measures Suggesting Increased Capability. Numbers of ships are an important measure of the ability of the Navy to meet crises and to mass forces in the event of war. But other measures are a better guide to sea-based firepower, and some of these measures actually suggest that the Administration's planned forces would result in an increase in naval capability.

The Navy's primary fleet of surface ships (cruisers, destroyers, and frigates) seems likely to decline in number by about 20 percent between 1991 and the year 2010. Nevertheless, the missile-carrying capacity of this fleet would increase by about 25 percent over the same period because newer ships carry many more missiles than the older ships that they will replace (see Figure 2). For example, new DDG-51 guided missile destroyers carry 90 missiles, in contrast to the 40 or so missiles aboard the DDG-2 ships that they will replace. In addition to carrying more missiles, the newer surface ships are equipped with the Mark 41 Vertical Launch System that can store and fire several types of missiles. Thus, these new ships will permit more flexibility to tailor missile loads to the demands of a particular mission.

Similar growth in capacity to carry weapons would occur on attack submarines under the Administration plan. The number of ships would de-

Figure 2.
Missiles on Surface Combatants

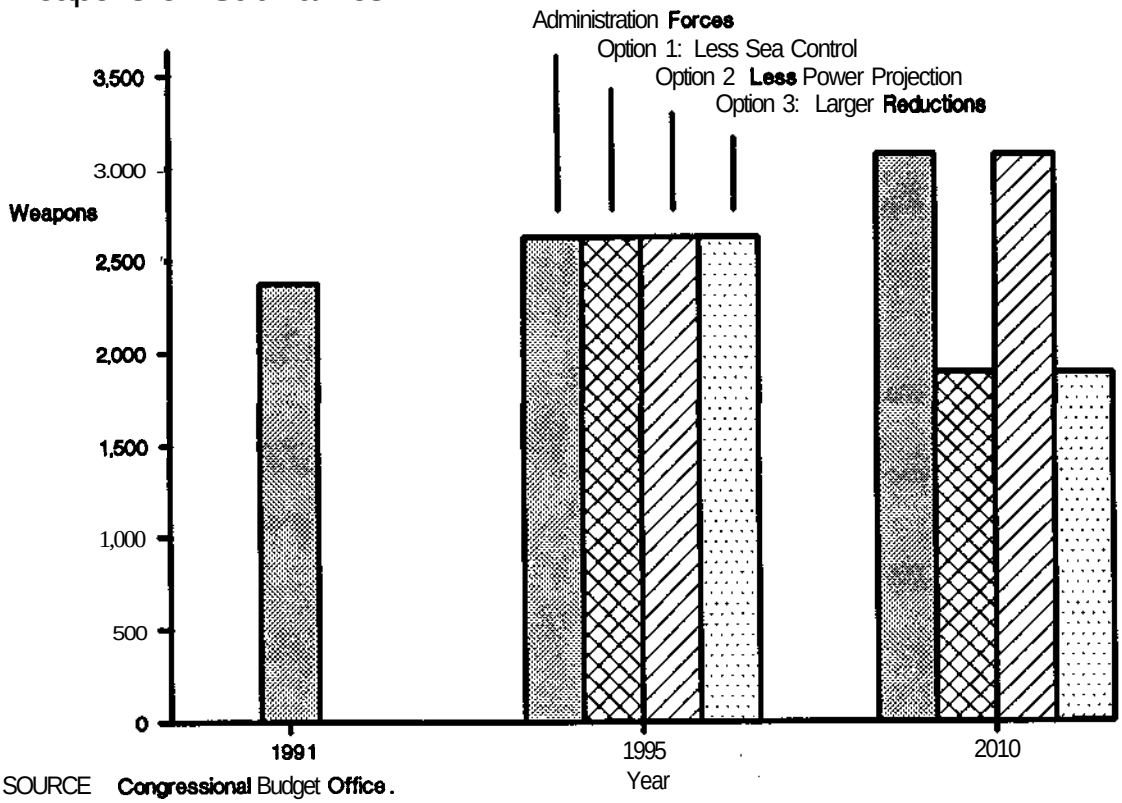


SOURCE: Congressional Budget Office.

cline by 8 percent between 1991 and the year 2010. Yet the capacity of the submarine fleet to carry weapons would rise by about 30 percent (see Figure 3).

An analogous trend may also occur in the capability of naval aircraft. Between 1991 and 2010, the number of air wings (each of which typically contains 80 to 90 planes) would decrease under the Administration's plan from 14 wings to 13 wings. However, the Administration also plans to develop and buy the AX attack aircraft, a new plane that will probably have increased range and advanced stealth characteristics. The Navy believes that stealth capability will greatly enhance the performance of the AX aircraft. The Chief of Naval Operations recently testified that nonstealth aircraft were lost to enemy attack at rates at least six times greater than those for stealth aircraft in computer simulations of possible future Middle East combat scenarios. Thus, while there would be fewer aircraft under the Administration plan than there are today, the overall capability of the remaining planes might be greater.

Figure 3.
Weapons on Submarines



SOURCE Congressional Budget Office.

Effects on Costs

The Administration's naval plans would also have important effects on future Navy budgets. It takes years to build Navy ships and aircraft, and they remain in the fleet for decades. Thus, in order to assess likely budget trends, CBO estimated the size of the Navy budget over a long period--from 1991 to the year 2010. The choice of the year 2010 as an end point is arbitrary. It represents a compromise between choosing an earlier year, which would not fully capture some important procurement programs that would be required to maintain the Administration's planned forces, and a later year that would entail more speculation about future programs.

Lower and Higher Estimates. There are, of course, many uncertainties about the future costs of Navy programs, particularly about costs that would be incurred in the next decade. To reflect these important uncertainties, CBO made a lower estimate under optimistic assumptions that might materialize if the Navy takes far-reaching actions to hold down its costs, particularly the costs associated with new weapons. CBO also estimated higher costs that assume increases more consistent with past experience.

The lower-cost estimates rely on Navy estimates of the costs of buying new weapons; there is no allowance for cost growth above these estimated

levels. Where Navy estimates for new weapons are not yet available, the lower estimates assume that new weapons do not cost significantly more than earlier versions. Because the Navy has said that it will study the possibility of designing a new, cheaper attack submarine as a follow-on to the SSN-21 submarine, and a cheaper destroyer to follow the DDG-51, the lower estimate assumes that, beginning early in the next century, attack submarines and destroyers cost about one-third less than today's SSN-21 submarines and DDG-51 destroyers, respectively.

The higher estimates assume that costs grow above planned levels based on historical trends and the length of time that would elapse before the new system enters production. For example, ships are assumed to grow in cost by about 3 percent a year in real terms, consistent with past experience. Where Navy estimates for new weapons are not available, the higher-cost estimates are more consistent with historical experience, which suggests that new weapons tend to cost substantially more than the systems they replace. (See the appendix for more details about the assumptions.)

The lower-cost estimates also assume that categories of the Navy budget that cannot be related directly to ships and aircraft remain constant in real terms at their planned 1997 level. Historically, however, these categories of spending--which include research and development (RDT&E),

procurement of Navy weapons (WPN) and other equipment (OPN), and Marine Corps weapon procurement (PMC)--have tended to rise in proportion to either procurement or total spending. The higher-cost estimates assume proportional increases (see appendix for details).

Cost Estimates. Between 1991 and the year 2010, the Administration's planned forces would require increases in the Navy's total budget level that, after adjustment for inflation, average between 0.1 percent and 2.1 percent a year (see Table 2). The budget in 2010 would exceed the 1991 budget level by about $1 billion to about $46 billion. The wide range of estimates reflects the effects of the cost growth assumptions under the lower and higher cost estimates. (Throughout this testimony, all costs are expressed in constant 1992 dollars of budget authority. Percentage changes are based on constant-dollar estimates of costs.)

The pattern of real growth differs sharply during interim periods between 1991 and 2010. Between 1991 and 1995, the Navy budget declines by an average of about 2.6 percent a year under the Administration plan, leaving the 1995 Navy budget about $9 billion lower than its budget in 1991. Most of the reduction occurs because the Administration plan reduces the size of the Navy and, hence, its operating budget. This reduction is assumed to take place under both the lower and higher estimates of costs. The budget

TABLE 2. AVERAGE ANNUAL REAL GROWTH IN TOTAL NAVY BUDGET (In percent)

Time Period	Options			
	Admin-istration Forces	I Less Sea Control	II Less Power Projection	III Larger Reductions
	Lower Estimate			
1991-2010	0.1	-0.2	-0.3	-1.0
1991-1995	-2.6	-2.9	-2.9	-4.4
1995-2010	0.8	0.5	0.4	-0.1
	Higher Estimate			
1991-2010	2.1	1.5	1.3	-0.4
1991-1995	-2.6	-2.9	-2.9	-4.4
1995-2010	3.4	2.7	2.5	0.7

SOURCE: Congressional Budget Office.

reduction is part of the cuts imposed by the Defense Department to meet the limits imposed by the Budget Enforcement Act of 1990.

In the years following 1995, the Navy's budget would have to increase. Between 1995 and 2010, the Administration's planned forces would require budgetary increases averaging between 0.8 percent a year, under the lower estimate, and 3.4 percent a year, under the higher estimate. The budget in the year 2010 would be higher by between about $11 billion and $55 billion compared with the level planned for 1995. The most rapid growth would probably occur in the middle and latter part of the next decade.

The growth in the years beyond 1995 occurs because the number of ships and aircraft no longer declines while procurement funds grow sharply to pay for expensive new weapons. Between 1996 and 2010, procurement funding for ships and aircraft grows by an average of between 4 percent and 7.5 percent a year, depending on the assumptions about increases in future weapon costs (see Table 3). This rapid growth reflects Administration plans to purchase several new types of aircraft, including the AX attack aircraft and the new E/F version of the F/A-18 aircraft. Procurement funding also reflects the purchase of three new aircraft carriers and an average of about three attack submarines a year, which would be needed to maintain a fleet of

TABLE 3. AVERAGE ANNUAL REAL GROWTH IN COSTS FOR NAVY PROCUREMENT OF SHIPS AND AIRCRAFT (In percent)

Time Period	Options			
	Admin-istration Forces	I Less Sea Control	II Less Power Projection	III Larger Reductions
	Lower Estimate			
1991-2010	3.3	2.9	3.0	1.3
1991-1995	0.9	0.9	-0.9	-3.7
1995-2010	4.0	3.5	4.1	2.6
	Higher Estimate			
1991-2010	6.1	5.0	4.8	3.5
1991-1995	0.9	0.9	-0.9	-3.7
1995-2010	7.5	6.1	6.4	5.6

SOURCE: Congressional Budget Office.

80 such vessels. Large purchases of aircraft will cause the Navy's aircraft procurement account to add pressure to Navy budgets, rather than providing a source of funds for additional ship procurement.

By the middle and latter part of the next decade, the Navy's costs could grow especially rapidly as the Navy purchases several new types of aircraft as well as new classes of surface combatants and ballistic missile submarines, in addition to weapons systems such as attack submarines and the AX aircraft.

Budgetary growth could be slower if the Navy defers the purchase of some of the new classes of aircraft until after the year 2010. Last October, Admiral Richard Dunleavy, Assistant Chief of Naval Operations (Air Warfare), said the Navy planned to field several new aircraft in the first decade of the next century including: an Advanced Tactical Support Aircraft (which would replace the S-3A, E-2C, and EA-6 aircraft), a variant of the Air Force's advanced tactical fighter to replace F-14s, a successor aircraft to the F/A-18 and AV-8B, and the AX. But in May of this year Admiral Dunleavy testified that the Navy would defer some of these programs because of cost concerns. The exact nature of the Navy's new plan is unclear. The service may modify older aircraft instead of buying new aircraft, or it may simply decrease the number of planes in its air wings. The estimates in Tables 2 and 3 assume purchases of replacements for the S-3A, E-2C, EA-6, F/A-18, and

AV-8 aircraft. Deferring procurement would hold down costs. Should the Navy, for example, not buy any of the replacements for the S-3A, E-2C, and EA-6 aircraft or any variants of the Air Force's advanced tactical fighter, real growth in the Navy's budget from 1995 to 2010 would range from 0.5 percent to 2.5 percent a year compared with the estimates of ,0.8 percent to 3.4 percent in Table 2.

These reduced estimates may, however, understate likely future costs and so are not reflected in Table 2. It will be difficult for the Navy to keep planes for the extended periods implied by these reduced estimates. For example, if the Navy does not buy any Advanced Tactical Support Aircraft (ATSA) until after the year 2010, then it will be operating some carrier-based S-3 aircraft (one of the planes to be replaced by the ATSA) until they are in their mid-thirties. If the service does not begin development of an ATSA until after 2010, it will have to retain S-3 aircraft until they are well over 40 years of age. Admiral **Dunleavy,** in his May testimony, expressed concern about keeping carrier-based aircraft in service beyond 30 years.

The Outlook for Long-Term Budgetary Growth

It is possible that naval budgets will grow enough to accommodate the Administration's plans. The required growth is substantially less than the

growth of 3 percent to 5 percent a year that was associated with plans in the mid-1980s for a 600-ship Navy.[2] Moreover, increases under the current Administration plan would be consistent with past growth in U.S. gross national product (GNP). Long-term average GNP growth has amounted to about 2 percent to 3 percent a year, which would finance most of the Administration's planned forces under the higher-cost assumptions. Even if the whole defense budget remained constant in real terms or grew at a rate less than long-term GNP growth, the Administration and the Congress might decide to allocate a larger share of the total defense budget to the Navy. Finally, the Administration may hope to pay for some growth in costs by achieving efficiencies in its operations, though in the past the Defense Department has had difficulty achieving large dollar reductions through efficiencies.

However, it is also plausible to assume that, rather than increasing after 1995, the defense budget could remain constant or decline further. Moreover, Operation Desert Storm emphasized the need for a wide variety of military forces, which may preclude substantial increases in the Navy's share of the total defense budget. Thus, the Congress and the Administration may have to consider alternatives that would lower the cost of naval forces.

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2. Congressional Budget Office, *Future Budget Requirements for the 600-Ship Navy* (September 1985).

OPTION I. LESS EMPHASIS ON SEA CONTROL

One approach to holding down costs would reduce emphasis on one of the Navy's principal missions--sea control. Sea control forces are designed to ensure that the United States can use the seas freely and safely in peace and war. Reducing emphasis on sea control would be consistent with the conclusion that a major war with the Soviet Union, the nation that could pose the greatest threat to U.S. ability to control the seas, is unlikely.

Enemy submarines are the greatest threat to sea control. Therefore, less emphasis on sea control means less emphasis on antisubmarine forces, which include U.S. attack submarines and antisubmarine aircraft. Specifically, this option would reduce the fleet of U.S. attack submarines from its eventual level of about 80 ships under the Administration plan to about 45 ships (see Table 1). The total size of the fleet would decline to 380 ships in 2010, compared with 415 ships under the Administration plan. This option would also retire roughly one-half of the fixed-wing aircraft whose principal job is to find and destroy enemy submarines. These are P-3 land-based aircraft and S-3 carrier-based aircraft. Procurement plans would be reduced to be consistent with the smaller forces, but the Navy is assumed to continue to

procure the advanced weapons systems now in development (see Table A-1 in the appendix for more details about planned procurement).

Arguments For and Against Less Sea Control

Under this option, the U.S. fleet of attack submarines would be able to carry out fewer peacetime patrols. Also, in the event of a war, the United States would not be able to deploy as many submarines simultaneously as it could today, thus reducing wartime capability. The option would have comparable effects on aircraft designed to destroy enemy submarines. These reductions in U.S. antisubmarine capability would occur even though, according to testimony by the Navy, the Soviet Union continues to produce highly capable attack submarines in substantial numbers.

This reduction in U.S. capability may, however, be acceptable in a world where war with the Soviet Union seems unlikely. Few other countries have substantial submarine fleets. China has a substantial fleet of attack submarines (110 ships including 4 nuclear-powered vessels). But the countries that seemingly represent the most plausible future opponents of the United States have much smaller fleets. North Korea, for example, has 22 attack submarines; Libya has six; Cuba has three. None of the ships in these countries' fleets is nuclear powered or as highly modern as the U.S. fleet.

Reductions in the size of the U.S. submarine fleet are also consistent with a continuation of the policies stated in a recent review by the Secretary of Defense. The Major Warship Review, released in August 1990, called for procurement of an average of one and one-half attack submarines a year between 1991 and 1994. The Administration's budget plan for 1992 to 1997 further reduced procurement to a little more than one a year. If procurement levels return to those stated in the Major Warship Review and continue over a long period, the United States would eventually deploy a fleet of about 45 attack submarines.

Effects on Costs

The reduction in sea control forces assumed under this option would modestly reduce the future costs of the Navy. But the Navy budget would still have to grow in the years beyond 1995.

Under the lower-cost assumptions, there would be a slight decline (averaging 0.2 percent a year) in the Navy's budget between 1991 and 2010, compared with a slight increase (averaging 0.1 percent a year) associated with the Administration's planned forces (see Table 2). An increase of about 1.5 percent a year would be required under the higher-cost assumptions,

compared with the 2.1 percent a year that would be associated with the Administration's planned forces.

Under this option there would also be shifts in the pattern of growth during interim periods. The decline in the Navy's budget between 1991 and 1995 would be slightly larger under this option (averaging 2.9 percent a year compared with 2.6 percent a year under the Administration plan). The larger decline reflects the early retirement of older aircraft. Budgets would still have to grow beyond 1995 under this option, though by a smaller amount than the growth under the Administration plan. Depending on the costing assumptions, average annual growth after 1995 would range from 0.5 percent to 2.7 percent a year, compared with the 0.8 percent to 3.4 percent a year that would be required under the Administration's plan. The smaller long-term growth occurs primarily because of the need to buy fewer new attack submarines and submarine-hunting aircraft, but these reduced procurement needs are not enough to avoid the need for long-term growth in the Navy's budget.

OPTION II. LESS EMPHASIS ON POWER PROJECTION

An alternative approach to reducing the cost of naval forces would leave untouched those forces dedicated primarily to sea control and instead reduce aircraft carriers and associated forces that are designed primarily to project U.S. military power overseas. This option would be consistent with a willingness to accept a delay in the response of carrier forces to future international crises and, in the event of a war, to accept less carried-based capability.

Specifically, this option would reduce the number of aircraft carriers to 10 by 1995, compared with the 12 carriers under the Administration's planned forces (see Table 1). This option would also reduce the number of air wings that fly off carriers and the number of surface combatants. The total number of ships in the fleet would decline to 385 by the year 2010. The Navy is assumed to continue to buy the same types of weapons it now plans to purchase but in smaller numbers that would reflect the reduced size of the fleet (see Table A-1 in the appendix).

Arguments For and Against Less Power Projection

Under this option, the United States would have fewer carrier-based forces in the event of a major war, which would reduce U.S. capability to mass its forces quickly. For example, with only ten carriers, the Navy would have had more difficulty deploying six carriers during Operation Desert Storm and would have had fewer carriers available to meet other military contingencies.

The reduction in carriers might also slow the response of carrier-based forces in the event of an international crisis. With ten carriers, about three would typically be deployed overseas in peacetime. If more than three carriers were needed overseas, or if one was needed in a location far from its area of patrol, carriers based in the United States would have to prepare to leave port and travel to the location of the crisis. That could require several weeks or more.

Nevertheless, under this option the United States would have a substantial fleet of aircraft carriers, by far the largest fleet in the world. This fleet might be of acceptable size, particularly in a period when the chance of war with the Soviet Union seems low. Indeed, a fleet of between 10 and 12

aircraft carriers has been recommended by the chairman of the Senate Committee on Armed Services.

Effects on Costs

Compared with the option that reduces emphasis on sea control, this one would save more money. But this approach would still not eliminate the need for post-1995 increases in the Navy's budget, even under the lower-cost assumptions.

Between 1991 and 2010, the Navy's budget under this option could fall by about 0.3 percent a year or grow by 1.3 percent a year, depending on the costing assumptions (see Table 2). As with previous options, declines would occur through 1995, and the declines would be larger than under the Administration plan. Beyond 1995, however, the Navy's budget would still have to increase by between 0.4 percent and 2.5 percent a year in order to pay for the 10 aircraft carriers and the other ships maintained under this option.

As under the previous options, the growth in costs beyond 1995 would be fueled primarily by the costs of procuring ships and aircraft, which would grow much faster than the overall budget (see Table 3). The most rapid

growth in costs would be likely to occur in the middle or latter part of the next decade.

OPTION III. LARGER REDUCTIONS IN NAVAL FORCES

Even under the lower-cost assumptions, neither of the first two options could be accommodated if the Navy's budget remained roughly constant in real terms beyond 1995. Yet it seems plausible that the Navy's budget might not grow in real terms after 1995. If the post-1995 budget remained constant in real terms, what sort of a Navy would fit?

There are, of course, many answers to this question. To illustrate one feasible approach to accommodating a constant budget, Option III assumes a decrease in forces for both sea control and power projection. Like Option I, this one assumes that, by the year 2004, the Navy has a fleet of only 45 attack submarines and a reduced force of fixed-wing aircraft designed to hunt and destroy enemy submarines. This option also assumes a decline to nine aircraft carriers along with associated reductions in air wings and surface combatants.

In addition, this option assumes reductions in surface combatants beyond those associated with the reduction in aircraft carriers. These additional reductions imply a cut in the surface combatants that typically accompany an aircraft carrier from about six to five. In an environment where carriers are less likely to face Soviet bombers that can threaten them from long ranges, a smaller number of surface combatants may provide adequate defenses.

Finally, this option adopts a "silver-bullet" approach to fighter and attack aircraft. Under the Administration plan, about one-third of the fighter and attack aircraft aboard aircraft carriers would eventually consist of the new AX attack plane, which would be designed to have advanced stealth characteristics. The remaining two-thirds of the fleet of fighter and attack aircraft would consist of relatively less costly and less capable planes.

In contrast, under the silver-bullet approach only about 10 percent of the fleet of fighter and attack aircraft would consist of the highly capable AX aircraft. This small fraction of highly capable aircraft--the silver bullets--would be used to attack the most highly defended targets. The other 90 percent of the fleet would eventually be equipped with relatively less capable fighters that are assumed to cost about as much as today's version of the F/A-18 aircraft. Thus, under this option, the Navy would not develop the

improved E/F version of the F/A-18 plane, which would increase the capability but also the cost of the F/A-18 aircraft.[3]

Together, all the changes assumed under this option would lead to a Navy with about 310 ships. This fleet would include 9 aircraft carriers and 10 air wings of aircraft equipped under the silver-bullet concept.

Arguments For and Against Larger Reductions

Many of the arguments cited in opposition to the first two alternatives would apply to this approach, sometimes to a greater degree because this option would retain nine rather than ten carriers. In addition, the Navy might argue that the reduction in surface combatants surrounding each carrier would be unacceptable. Even if the threats from Soviet long-range aircraft decrease, the lower level of surface combatant vessels might leave the Navy unable to perform other missions, such as accompanying amphibious warfare ships or conducting operations that are independent of an aircraft carrier.

Also, the Navy would probably not support the silver-bullet approach that combines a few highly capable aircraft with a large number of relatively less capable planes. A less capable aircraft would not have adequate range

3. For more discussion of this and other options for naval aircraft, see Testimony of Robert F. Hale before the Subcommittee on Defense, Senate Committee on Appropriations, May 8, 1991.

and capability, in the Navy's view. Moreover, the number of well-defended targets in a future conflict might exceed the small number of highly capable aircraft that would be available under this silver-bullet approach.

Despite the arguments against this approach, the Navy proposed under this option would remain a substantial force. Ship counts alone understate capability under the option because many of the ships in the future fleet would be more capable than today's versions. For example, while the number of primary surface combatants and attack submarines under this option would both decline below today's level by about 50 percent, the number of weapons aboard these types of ships would decline by only 12 percent and 20 percent, respectively. The Navy would also retain the world's largest and most capable fleet of aircraft carriers. Thus, the smaller fleet envisioned under this option might be adequate to protect U.S. security interests, particularly if the major threats to U.S. security came from countries other than the Soviet Union.

Effects on Costs

Moreover, if the Navy is successful at holding down the costs of weapons, this version of the Navy would fit within a budget that was roughly constant in the years beyond 1995. Under the lower-cost assumptions that assume little growth above planned levels in the unit costs of weapons, the Navy's budget

would remain roughly constant at its 1995 level through the year 2010 (see Table 2). Procurement costs for ships and aircraft would grow by a substantial amount, but the growth would be offset by declines in operating costs associated with the reduction to 310 ships (see Table 3).

Under the higher-cost assumptions, however, the growth in procurement costs would not be fully offset, and the Navy's overall budget would grow by an average of 0.7 percent a year between 1995 and 2010. The budget in 2010 would exceed its level in 1995 by about $9 billion. Thus, if costs of weapons systems grow as they have tended to do in the past, the Navy might have to reduce its fleet below 310 ships in order to maintain a constant budget beyond 1995. Alternatively, the Navy could consider holding down costs by keeping ships in service longer than is now planned or by redesigning new vessels to be cheaper.

The larger reductions assumed under this option would also have important effects on the Navy budget between 1991 and 1995. In that period, the total budget would decline at a faster annual rate (about 4.4 percent) than it would under the Administration plan (which results in an annual decline of 2.6 percent). Thus, by 1995 this option could reduce naval spending by as much as $6 billion compared with the funding level requested by the Administration.

CONCLUSION

Future budgetary limits will clearly have an important effect on the Navy. If added funds are not available beyond 1995, for example, then the Navy will have to make major changes in its plans--perhaps reducing its fleet to no more than 310 ships and 9 carriers equipped with fewer of the most capable aircraft.

The debate about what Navy the United States needs and can afford should begin now. If the Congress decides to maintain the Administration's planned forces, rapid growth in costs may not begin until the early or middle part of the next decade. Nonetheless, cost concerns could become much more immediate if the Congress elects to impose budgetary cuts larger than those proposed by the Administration between now and 1995 or if substantial budgetary reductions continue in the years right after 1995. Moreover, key decisions that are being made in the next few years will have important effects on the choices that will confront the Congress in future years. Among those key decisions: whether and how quickly to design and field the new AX attack aircraft; whether to upgrade the capability and increase the cost of the F/A-18 aircraft; and the nature and cost of the attack submarine that will replace the SSN-21.

Finally, the debate over the future of the Navy is important to the **U.S.** defense budget and to the security of the United States. It would be preferable to begin that debate today, while there is time to deliberate, rather than waiting until budgetary pressures demand a quick answer.

APPENDIX:

COSTING METHODS AND SUPPLEMENTARY DATA

The costs of the Administration plan used in this testimony for 1992 to 1997 are those specified in the Administration's Future Years Defense Plan (FYDP). Costs to maintain the Administration's planned forces beyond 1997, and costs under the options in all years, were estimated using methods that vary according to the category of costs. In all cases, costs were based on budget authority and were calculated in constant 1992 dollars.

Ship Procurement (SCN) and Aircraft Procurement (APN)

In 1991, ship and aircraft procurement accounted for about 17 percent of the Navy's total budget. In this testimony, most categories of ship and aircraft procurement were estimated explicitly. That is, CBO estimated the number of weapons that would have to be purchased based on the desired size of the force under each option and on the expected retirement age of existing weapons. Table A-1 shows estimated procurement for key weapons systems in various time periods. Table A-2 shows the retirement ages assumed in estimating required levels of procurement.

TABLE A-1. SELECTED SHIPS AND AIRCRAFT PROCURED FROM 1992 THROUGH 2010

Type of Force	Options			
	Administration Forces[a]	I Less Sea Control	II Less Power Protection	III Larger Reductions
Ships				
Aircraft Carriers				
1992-1997	1	1	1	1
1998-2010	3	3	1	0
Attack Submarines				
1992-1997	7	6	7	6
1998-2010	39	19	39	19
Guided Missile Destroyers				
1992-1997	22	22	18	9
1998-2010	38	38	23	15
Strategic Ballistic Missile Submarines				
1992-1997	0	0	0	0
1998-2010	6	6	6	6
Aircraft				
AX				
1992-1997	0	0	0	0
1998-2010	370	370	298	125
S-3/EA-6[b]/E-2C/ATSA				
1992-1997	12	12	12	0
1998-2010	186	102	155	102
F/A-18/AV-8/STOVL				
1992-1997	348	348	149	234
1998-2010	842	842	942	1,168
P-3/Replacement				
1992-1997	0	0	0	0
1998-2010	261	165	261	165

SOURCE: Congressional Budget Office.

a. For 1992 through 1997, CBO used procurement plans published by the Administration. For 1998 through 2010, CBO assumed procurement plans that, combined with projected retirements and other assumptions, would maintain 12 aircraft carriers, 80 attack submarines, 150 surface combatants, 18 strategic ballistic missile submarines, 13 carrier air wings, 4 Marine Corps air wings, and the Administration's forces of land-based maritime patrol aircraft.

b. Excludes remanufactured EA-6Bs.

TABLE A-2. SERVICE LIVES ASSUMED FOR SHIPS

Type of Ship	Service Life Assumed (Years)
Ballistic Missile Submarines	30
Attack Submarines	30
Aircraft Carriers	45
Cruisers	40 or 30[a]
Destroyers	40
Frigates	30[b]
Amphibious Warfare Ships	35
Mine Warfare Ships	30
Patrol Combatants	30
Combat Logistics Ships	40
Other Support Ships	40

SOURCE: Congressional Budget Office.

a. CBO assumed a notional service life of 40 years for CG-47 Ticonderoga class cruisers and 30 years for others.

b. CBO assumed a service life of 20 years for about one-third of the 51 FFG-7 Perry class frigates and 30 years for the remaining FFG-7s.

Under the options, some weapons systems were retired at times before those suggested by the retirement ages in Table A-2. This was done in order to complete the transition to the new, lower force levels under the options in a reasonable period of time. For example, under the options some guided missile frigates were retired before they reached 30 years of service to keep surface combatant levels consistent with a force of 10 aircraft carriers. In other cases, procurement was undertaken somewhat earlier or later than would have been necessary in order to produce a reasonably smooth pattern. For example, in Option III an aircraft carrier is purchased in 1995, rather than in a later year, to avoid a precipitous decline in shipbuilding funds.

The unit costs of the weapons varied between the lower-and higher-cost cases shown in Tables A-3 and A-4. In general, the lower-cost cases used estimates for unit costs that are based on data from the Department of the Navy and the Department of Defense. Most other new weapons systems were assumed not to cost much more than the systems they replaced. For attack submarines and guided missile destroyers only, CBO assumed that--beginning in 2002--unit prices would be one-third lower than current unit prices. The Navy is studying lower-cost destroyers and submarines, and the lower-cost estimates assume that these new ships could be designed and developed within the next 10 years.

TABLE A-3. UNIT PROCUREMENT COSTS FOR SHIPS
(In millions of 1992 dollars)

Designator[a]	Weapons System	Lower Unit Cost	Higher Unit Cost
AGF	Command Ship	350	400
AGOS	Surveillance Ship	200	200
AOEV	New Logistics Ship	300	400
AR	Repair Ship	500	600
AS	Submarine Tender	400	500
ATR	Rescue and Salvage Ship	100	100
CVN	Aircraft Carrier	4,000	4,900
DDG	Guided Missile Destroyer	600	1,100
LHD	Amphibious Assault Ship	1,000	1,200
LSD	Dock Landing Ship	300	400
LX	New Amphibious Ship	400	500
MHC	Coastal Mine Hunter	100	100
PHM	Patrol Combatant	100	100
SSBN	Ballistic Missile Submarine	1,400	1,700
SSN	Attack Submarine	1,400	2,500

SOURCE: Congressional Budget Office.

a. Designators are symbols used by the Navy to represent types of ships. They are not acronyms.

TABLE A-4. UNIT PROCUREMENT COSTS FOR AIRCRAFT
(In millions of 1992 dollars)

	Administration Plan and Options I and II		Option III	
Type of Aircraft	Lower Unit Cost	Higher Unit Cost	Lower Unit Cost	Higher Unit Cost
AX	100	160	125	190
AH-1W	10	15	10	15
S-3/EA-6/E-2C/ATSA	70	140	70	140
CH/MH-53	30	40	30	40
CH-60B	30	40	30	40
HH-60H	30	40	30	40
F/A-18	60	75	40	50
P-3 Replacement	50	60	50	60
SH-60	30	40	30	40

SOURCE: Congressional Budget Office.

Under the higher-cost case, CBO assumed that unit costs grew above the levels currently estimated by the Navy. Where Navy cost estimates are not available, CBO used historical patterns as a guide. Ship costs, for example, were assumed to grow by 3 percent a year in real terms. This is consistent with cost growth between generations of ships.

CBO used average unit procurement costs to estimate costs in each year when a weapon was bought. These average costs do not capture the actual pattern of unit costs, which are higher early in a buy and lower later in the buy. Nevertheless, the use of average unit costs seemed appropriate for this testimony, which is designed to illustrate likely cost trends over a long period of time rather than to estimate precise costs in a particular year.

Portions of the APN account pay for modifications and spare parts. In the lower estimate of costs, the planned 1992 levels for these costs were assumed to remain constant in all years beyond the FYDP period. In the higher estimate, these categories of costs were assumed to increase above their 1992 level in proportion to increases in the remainder of the APN account.

Operating Costs

Operating costs are defined in this testimony as funds in the appropriations for military personnel and operation and maintenance. Together, these operating costs account for about 59 percent of the Navy's 1991 budget.

Operating costs were estimated using CBO's Defense Resources Model (DRM). The DRM is primarily a projection model rather than a predictive model. It does not predict future action by the Administration or the Congress, such as changes in operating tempos or reductions in costs achieved through efficiencies. Instead, the DRM projects costs based on current cost relationships that reflect the many personnel, facilities, and weapons policies affecting operating costs. Cost factors are computed on the assumption that the costs of operating a unit of force, for example, an aircraft carrier or an air wing, are best measured by what the Navy now spends on that unit. When a new ship or wing enters the force, operating costs increase by the amount of the appropriate factor. Conversely, when an older weapon is retired, operating costs decrease by the amount of the appropriate factor.

CBO uses the DRM to estimate the incremental impact on the budget resulting from changes in the numbers of forces. The cost factors capture all the operating costs that are directly or indirectly related to the force levels.

Other operating costs that cannot be readily related to ships or wings--for example, portions of the training and medical establishment, portions of base operating costs, and portions of administrative costs--are categorized by CBO as overhead. If changes in the numbers of forces are small, little or no change in these overhead activities would be expected. Larger changes in forces, such as those considered in this testimony, suggest eventual changes. Therefore overhead costs in this testimony are assumed to vary proportionately with changes in operating costs related to ships and aircraft.

Generally, cost estimates for operating new weapons systems are not available. Therefore, CBO usually assumes that a new weapons system will cost the same to operate as the old one it replaces. For example, CBO assumed that the cost to operate the new SSN-21 Seawolf submarine would equal the cost to operate existing attack submarines. This method may understate likely costs, because new systems usually cost more to operate than older ones. In a few cases CBO departed from this rule and made estimates using other systems as proxies for the new systems. For example, CBO used estimates of the cost to operate the CG-47 cruiser as a proxy for the operating cost of the new DDG-51 destroyer, because the two ships are roughly the same size.

Because the DRM estimates future operating costs based on current cost relationships, CBO's estimates do not always match the operating costs included in the Administration's plan. In order to reflect the Administration's policies, this testimony uses FYDP operating costs for the Administration plan in the period 1992 to 1997. To estimate operating costs for the options in the years 1992 to 1997, CBO applied DRM estimates of percentage changes in costs (that is, DRM estimates of costs under the option compared with DRM estimates of costs under the Administration plan) to FYDP costs. If, for example, the DRM estimates of 1995 operating costs under Option I were 2 percent less than DRM estimates of costs under the Administration plan, then the estimate of 1995 operating costs for Option I would be set equal to 98 percent of FYDP operating costs for 1995.

This method ensures that, if the Administration anticipates achieving efficiencies or other policy changes that affect operating costs, these same changes are reflected in cost estimates for the options. Indeed, it appears that the Administration does plan to achieve some efficiencies. For example, after adjustment for inflation and for declines in the number of active-duty military personnel, Navy operation and maintenance funding associated with active-duty forces falls by 6 percent between 1991 and 1997 under the Administration plan. This drop may reflect efficiencies related to implementing the recommendations of the Defense Management Review or

to other policy changes. The General Accounting Office has, however, questioned whether all the savings associated with the Defense Management Review will be realized. If some or all these savings are not realized, the estimates in this testimony could understate the size of the Navy budget under the Administration plan and under each of the options.

In the years beyond 1997, CBO's estimates of percentage changes were applied to the costs in the previous year to estimate operating costs. Thus, for example, if CBO projected a 1 percent decrease in operating costs between 1997 and 1998 under an option, then 1997 operating costs were decreased by 1 percent and used as the estimate of 1998 operating costs. This approach was used for the Administration plan and for each of the options.

Other Categories of Costs

Some categories of costs cannot be related directly to the numbers of ships and aircraft. These include procurement costs for other procurement (OPN), weapons procurement (WPN), and Marine Corps procurement (PMC). Also included are costs for research, development, test, and evaluation (RDT&E), family housing, and military construction. Together, these categories of costs accounted for about 24 percent of the 1991 Navy budget.

These other categories were estimated in different ways under the lower- and higher-cost cases. Under the lower-cost case, they were assumed to remain at their 1997 level throughout the period from 1997 through 2010. Under the higher-cost case, the other categories were assumed to vary either in proportion to changes in the size of funding for SCN and APN (in the case of procurement categories including OPN, WPN, and PMC) or in the size of total Navy funding (for RDT&E, family housing, and military construction).