

The U.S. Navy

The View from the Mid-1980s

Edited by

James L. George



The U.S. Navy

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About the Book and Editor

The 1980s have ushered in a new era for the U.S. Navy. Despite projections that the number of ships it had at the start of the decade would decline, the total is increasing, and the Navy is predicting that it will reach its long-sought goal of a 600-ship Navy by 1990. The numbers have risen, but debate over the type of ships that should be constructed has not been resolved. Meanwhile, recent developments in Soviet shipbuilding have raised, for the first time, concerns about the possibility that the U.S. qualitative lead in naval technology may finally be slipping. At the same time, the international geostrategic situation and especially permanent U.S. deployments in the Indian Ocean and in the Caribbean have led to increasing naval commitments. These international developments have broad implications for the Navy, and the contributors to this volume provide a thorough reassessment at the midpoint of the decade.

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The View from the Mid-1980s

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James L. George

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Introduction

James L. George

The U.S. Navy in the mid-1980s is in the best shape it has been in over a decade. There are more and better ships, personnel problems have been resolved, and readiness shortfalls are being overcome. Better yet, the goal of a 600-ship navy, once thought elusive, is within sight, and a modern fleet is expected to be maintained at least through the twenty-first century.

To fully appreciate the state of the Navy in the mid-1980s, one only has to look back five years. The following assessment of the U.S. Navy appeared in 1981 in *The Ships and Aircraft of the U.S. Fleet*:¹

During the 1980s the United States Fleet will probably decline in size, from the current 460-odd active, Navy-manned ships to possibly as few as 350 ships. At the same time, the Navy will have difficulty in manning even these ships with the quality of personnel needed to operate them effectively and continuously.

Compare that analysis with the assessment by Secretary of the Navy John Lehman in testimony before Congress on 6 February 1985:²

From the 479 battle force ships in the fleet when President Reagan took office, the fleet has grown to 530 ships today and 545 by the end of the fiscal year [FY 1986], reaching 600 by the end of 1989. There are currently 103 naval ships now under construction, conversion, or reactivation, at twenty-one different yards throughout the United States.

Commenting on the personnel situation, Secretary Lehman added:

The past four years have seen the most dramatic change in the manning of the Navy and Marine Corps in the 209 years of our history. From the worst retention and recruiting in postwar history in 1979 and 1980, we have risen to the highest figures achieved since we began keeping records. We are meeting 100 percent of our recruiting goals, and have achieved 95 percent high school graduates in the Marine Corps and 93 percent in the Navy. In virtually every category we have increased retention to record highs: in skilled enlisted ratings, in pilots and

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Naval Flight Officers (NFOs), in nuclear trained personnel and surface warfare officers. From a situation four years ago when some of our ships could not deploy on schedule because the fleet was manned at only 91 percent, we are now at 100 percent ship manning for a Navy that has grown by more than 50 ships. In 1981, 13 percent of our ships and 25 percent of our aircraft squadrons were reporting themselves not combat ready as a result of personnel shortages. Today those percentages have dropped to less than 1 percent of each. The petty officer shortfall, which stood four years ago at 22,000, has been reduced now to below 6,000 and will be eliminated by 1988 if current trends continue.

Finally, addressing the issue of readiness, the secretary said:

The fleet is more ready to go in harm's way than at any time in recent peacetime history. In the past four years, combat readiness for surface ships has improved by 29 percentage points, for nuclear attack submarines by 34 percent, and aviation squadrons by 42 percent. From FY 1981 to FY 1985, actual in-bin munition levels for Navy and Marine Corps major weapons (e.g., missiles and torpedoes) increased by 37 percent. . . . Despite the fact that there is a two- to three-year lag between funding and delivery, our overall ordnance stocks have grown between 10 and 60 percent larger than they were in 1981 and are increasing literally every day as deliveries reach the fleet.

At the end of the Vietnam War, the U.S. Navy had just under 1,000 ships. About half of those, however, were World War II-era ships nearing the end of their useful life. Also, at that time the Navy decided to retire many still useful ships to build a modern fleet. The goal of a "600-ship navy" was thereby established. But as the years went on, that goal seemed to slip farther from reach. Indeed, shipbuilding rates actually declined. This combination of factors started to take its toll by the end of the 1970s, leading to the kind of gloomy assessment that appeared then.

Although President Reagan had promised a 600-ship navy in his campaign, such promises have a tradition of being ignored. Many wondered whether it was physically possible to build such a navy, considering the decline of U.S. shipbuilding capacity. Soon after taking office, however, the administration increased the current-year shipbuilding rate, and the trend continues. The buildup has included all types of ships, from the largest—aircraft carriers—to the smallest—minesweepers. Even once-decommissioned battleships—which many thought the world would never see again—have been reactivated. Future plans also look promising. Included in the FY 1986 five-year shipbuilding plan are a new guided-missile destroyer, the DDG 51 *Arleigh Burke* class; a new nuclear-powered attack submarine, the SSN 21; a new amphibious ship, the LHD 1, which can carry vertical or short takeoff and landing (VSTOL) aircraft; and two new mine

warfare classes. These and other classes of ships now joining the fleet, such as the CG 47 *Ticonderoga* cruiser (equipped with the exceptional Aegis antiair system) and the improved *Los Angeles* submarine, mean that the U.S. Navy should have a sophisticated, modern fleet at least to the twenty-first century.

The Navy's air assets are also being modernized. The new F/A-18 Hornet strike-fighter is now joining the fleet, and its reliability and maintenance figures are breaking all previous records. The F/A-18 requires less than half the maintenance man hours per flight hour than the aircraft it replaces, allowing each squadron a reduction of about 50 people. Better yet, the flyaway costs have been reduced considerably, from \$22.5 million in FY 1982 to \$16.6 million for FY 1986. It appears that the Hornet, once much criticized, is meeting the expectations of its supporters.

Plans are also underway to update the Navy's F-14, already considered one of the best planes in the world. Starting in FY 1988, production will begin of the F-14D, which will include radar upgrades and new engines, avionics, and survivability features. Also in FY 1988, the Navy plans to modernize its medium bomber, the A-6, with a new model, the A-6F. A truly novel plane for the future, the V-22 Osprey, formerly known as the J VX tilt-rotor design, is also being developed.

Nor has strategy been neglected. One of the more damaging criticisms of the military has been that it is always fighting the "last war." History is full of examples of this, such as the calvary officers who ignored mechanized warfare and the battleship admirals who ignored air power. Since the end of World War II, however, with the introduction of nuclear weapons and the Soviet military buildup, an equally bad situation might have arisen of always preparing to fight the "next war," ignoring the fact that there have always been "present wars" to contend with. The chief of naval operations, Admiral James D. Watkins, in his 7 February 1985 statement on the Navy's FY 1986 posture and budget before the House Armed Services Committee addressed the dilemma of a country having to fight present wars while preparing for the next war. His comments centered on two principal themes: We live in an era of "violent peace," and the Navy operates in the front lines of this violent peace, continuing to demonstrate deterrence across the spectrum of possible types of conflict. As Admiral Watkins testified:³

At the upper end of the spectrum, demarcations between peace and war are clear, and America today is at peace. But at the lower end of the continuum, differences between war and peace are blurred. Our forces, deployed in their traditional roles

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of presence and crisis response, live daily with the threat and reality of violence from a variety of sources. America is at peace, but it is a violent peace. . . . The Navy's demonstrated deterrent value across the entire continuum of potential conflicts is based on forward deployment and flexibility. . . . We seek to deter a threat at a particular point on the spectrum of conflict, but when deterrence fails, we seek to control escalation.

He went on to remind the committee that "between 1946 and 1982, in some 250 instances of employment of American military forces, naval forces were used about 80 percent of the time." The reasons for selecting the Navy as the instrument for crisis management and deterrence, according to Admiral Watkins, are:

- Forward-deployed posture and rapid mobility make naval forces rapidly available at crisis locations worldwide, providing significant deterrent value and reducing the likelihood of ambiguous or short warning.
- Naval forces maintain consistently high states of readiness due to forward deployments, ensuring operational expertise and day-to-day preparedness.
- Naval forces increasingly operate with armed forces of our friends and allies. We now routinely operate with our sister services in joint operations and exercises.
- Naval forces bring the range of capabilities required for a credible deterrent. Capabilities demonstrated in actual crises include maintaining presence, conducting surveillance, threatening the use of force, conducting naval gunfire or air strikes, landing Marines, evacuating civilians, establishing a blockade or quarantine, and preventing intervention by Soviet or other forces.
- Perhaps most importantly, naval forces have unique escalation control characteristics that contribute to effective crisis control. Naval forces can be intrusive or out of sight, threatening or nonthreatening, easily dispatched but just as easily withdrawn. The flexibility and precision available in employing naval forces provides important escalation control in any crisis, but has particular significance in crises which might involve the Soviet Union. The Navy remains keenly aware of its crucial role in this area and has devoted increasing attention to employment of naval forces in this capacity.

He continued by saying:

Our experience leads to the following observations:

- Deterrence requires forward-deployed forces, both for preventive and reactive reasons. Current commitments to extended deterrence and the potential range of crises require a balanced, 600-ship Navy.
- Deterrence requires ready and sustainable forces, implying continued emphasis on our readiness and sustainability programs.

- Deterrence requires capabilities adequate to the threat. Increasing Soviet global reach and proliferation of modern weaponry demand the highly capable forces we are now building.
- Finally, deterrence requires an ability to cope with all levels of the conflict continuum, including international terrorism.

Unfortunately, those statements by Admiral Watkins have not had the publicity they deserve; yet they are among the best, most succinct statements of naval strategy and rationale.

There are, of course, some problems, but most of them are solvable. Probably the most serious problem is obtaining enough personnel to man the larger fleet. Congress has been reluctant to increase the Navy's end strength. The Navy requested an end-strength growth of 28,000 in FY 1983, but Congress approved only 19,100. For FY 1984, the Navy requested an increase of 11,900, but Congress approved 4,500. The request for FY 1985 was 10,700 and the approval was 6,500. According to the chief of naval operations, if this trend continues the Navy will be short 34,000 of that programmed for the 600-ship navy in FY 1989. After solving the personnel problem that existed in 1980, it would be a shame to return to that state.

Another problem is the concern that future shipbuilding plans may not be carried out. If, for example, the DDG 51 is not built on time and in sufficient number, the surface force could undergo major cuts when the 23 *Charles Adams*- and 10 *Coontz*-class destroyers reach block obsolescence in the 1990s. The Navy has been building at least 20 ships per year, the number needed to maintain a 600-ship navy, but a few years of building only 14 ships can easily disrupt this favorable trend.

Finally, the Soviet buildup cannot be ignored. While the U.S. Navy is building four or five submarines a year, the USSR is building nine or ten. Of even more concern, these new Soviet submarines are no longer the noisy clunkers of the past. Among the new, sophisticated Soviet surface ships are the *Kirov*-class "battle-cruiser," and now under construction is a modern nuclear-powered aircraft carrier. Although Soviet naval experts may argue the fine points about whether the Soviet force is a "blue-water" navy, most agree that it is no longer merely the unsophisticated coastal force of old.

The purpose of this book is to look at these and other issues facing the U.S. Navy today. The main topics covered are the naval air force, the surface force, the submarine force, and the theaters of operation. The papers presented were written by experts in their fields; the authors and commentators, in many cases, have had operational

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experience and have researched and written about the topics they discuss. The views expressed here are solely those of the participants and do not necessarily reflect the views of CNA or the U.S. Navy.

Many people are involved in putting together a conference and book. Thanks go to Thomas D. Bell, Jr., the President of Hudson Institute, and Admiral James C. Hay, the vice chief of naval operations, for their support. I would also like to express my appreciation to the many persons at the Center for Naval Analyses who helped, including Phil E. DePoy, Senior Vice President; Thomas E. Anger, Director of Finance and Administration; Keith R. Tidman, Director of Publications, who reviewed all the papers; Durinda Suttle, who did the typesetting; and Janice S. Weaver, who provided various support services.

Notes

1. Norman Polmar, *The Ships and Aircraft of the U.S. Fleet*, 12th edition (Annapolis, Maryland: Naval Institute Press, 1981), 1.
2. John F. Lehman, Jr., "A Report on the Fiscal Year 1986 Military Posture of the United States Navy and Marine Corps," 6 February 1985.
3. Admiral James D. Watkins, "A Report on the Fiscal Year 1986 Military Posture and Budget of the United States Navy," 7 February 1985.

Opening Remarks

Phil E. DePoy

The papers on the naval air force deal with several major issues that have been debated for a long time. If there has been agreement on anything among the parties involved in these debates, it is that the issues are very difficult. What makes these issues so difficult, of course, is that they tend to involve the confluence of such diverse matters as force levels, force mixes, new technology, cost and effectiveness, and the choice of missions.

The authors of the papers are eminently qualified in their subjects: Captain Al Bowen from the Congressional Research Service, the Library of Congress; Admiral Doug Mow, who currently is an independent consultant; and Dr. Dov Zakheim, the assistant under secretary of defense for policy and resources. Admiral Robert Schoultz, deputy chief of naval operations for air warfare, and Mr. Chuck Myers, an independent consultant, are the commentators.

Captain Bowen discusses the role of naval aviation and the carrier. Obviously, central to this subject is the Navy's goal of a 15-carrier force level. Captain Bowen leads us through the maze of issues that are driving this critical subject, including the attitudes of administration and congressional proponents and critics of the 15-carrier goal. He also discusses modernization of the air wings and a number of conceptual issues concerning the next generation of aircraft.

The topic of the second speaker, Admiral Mow, is the VSTOL aircraft—its turbulent history, its status today, and its prospects for the future. Admiral Mow also discusses the British experiences with VSTOL aircraft during the Falklands War.

Dr. Zakheim rounds out the discussion of the naval air force by talking about three missions of land-based air power in maritime warfare—attacks against surface ships, reconnaissance and early warning, and offensive mining. Dr. Zakheim discusses how the expected Soviet threat has reawakened interest in the use of land-based aircraft to supplement naval forces in these and other key missions.



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Sea-Based CTOL Aircraft

Captain Alva M. Bowen, Jr., USN (Ret.)

Background

The maritime strategy developed by the U.S. Navy to support the National Military Strategy depends on sea-based conventional takeoff and landing (CTOL) aircraft for its primary offensive and defensive punch. Within the operating radius of the air wing, sea-based naval aviation provides command of the air, which is necessary for other naval operations. Carrier aircraft can penetrate sophisticated defenses to deliver devastating air strikes against land targets. These capabilities enable the U.S. Navy to deny adversaries the use of the sea and to ensure that our shipping can use the sea lanes to project and sustain U.S. military power any place accessible from the ocean. Currently and for the foreseeable future, there is no other naval weapon with the power and flexibility of U.S. naval aviation. It provides our Navy with the essential edge over its principal rival, the Soviet Navy. These benefits have long been considered well worth the 50 percent of the Navy's investment budget and the 40 percent of its operating expenses historically devoted to sea-based air.

But the threat to sea-based aviation is growing. Carrier survivability has been an issue since the kamikazes of World War II. Their modern successors, cruise missiles, have raised the stakes. The viability of sea-based aircraft against sophisticated air defenses, even in the Third World, was being questioned long before the loss of carrier-based attack aircraft in Lebanon in December 1983.

Carriers can be defended, and carrier aircraft can continue to penetrate dense and sophisticated defenses to deliver their weapons, but at an increasing cost. The challenge to naval aviation today, as in the past, is to maintain and improve CTOL aircraft effectiveness without pricing the Navy out of business. Effectiveness must keep up with cost. If it does not, there are plenty of critics ready to divert the resources to some other use.¹

Navy Planning For CTOL Aircraft

For the near term, the Navy's planning provides for a buildup to 15 active CTOL carriers and 14 air wings. Whether that force structure will ever be achieved in peacetime and, if so, whether it can be maintained in the face of competing priorities, both within and outside the Department of Defense (DoD), are the questions addressed in this paper. To answer these questions, I will first examine Navy planning to obtain and maintain 15 carriers and to modernize the air wings. Later, I will address the issues likely to be raised by competing claims on the U.S. treasury and then speculate on the outcome of this resource allocation exercise.

Planning for 15 Modern Carriers

Since delivery of USS *Vinson* (CVN 70) in 1982, the Navy has operated 13 carriers. An additional carrier is out of commission in the Service Life Extension Program (SLEP) that will continue until the last *Forrestal*-class carrier (*Kennedy*) is completed in 1998. Two of the 13 operating carriers, *Midway* and *Coral Sea*, are of World War II design and are not capable of handling the standard Navy air wing. In particular, they cannot handle the F-14 aircraft considered essential for carrier survival against a high-intensity air threat. These two carriers' air wings lack fixed-wing ASW aircraft because the Navy decided to use available space for other kinds of aircraft. Therefore, they would have to be accompanied by a fully capable carrier for most wartime assignments.

Three new CVNs are under construction. They can increase the number of operating carriers as they are delivered, or replace the two old carriers, as shown in table 1.1. As can be seen from the table, to maintain 15 battle groups through the year 2000 requires keeping *Midway* (or *Coral Sea*) operational until after the *Kennedy* SLEP in FY 1998, at which time *Midway* would be 53 years old. (Table 1.1, which is not a Navy chart, assumes the 15-carrier goal overrides the age and limited capabilities of *Midway* and *Coral Sea*. If some other consideration should govern, the old carriers could be retired earlier, but the force level would drop below 15.)

In 2001, *Forrestal* will reach age 45, heralding the beginning of the end for that class of post-World War II carriers. By then they will have already had one service life extension of 15 years. Therefore, without more new carrier starts, the Navy will have 15 battle groups in the

1990s only by operating the smaller, less capable *Midway* or *Coral Sea* beyond an age of 50 years. Some analysts both within and outside the Navy believe this is unrealistic. Moreover, the *Forrestal*-class carriers will also probably have to be operated beyond their extended service lives unless some kind of orderly carrier-building program gains acceptance.

Table 1.1

Build-up to the 15-Carrier Goal

	<u>FY 1982</u>	<u>FY 1987</u>	<u>FY 1990</u>	<u>FY 1992</u>	<u>FY 1999</u>
Deliver	<i>Vinson</i> (CVN 70)	<i>Roosevelt</i> (CVN 71)	<i>Lincoln</i> (CVN 72)	<i>Washington</i> (CVN 73)	
Retire (age, in years)				<i>Coral Sea</i> (45)	<i>Midway</i> (53)
Resulting number of carriers	14	15	16	16	15
Carriers in SLEP	<i>Saratoga</i>	<i>Kittyhawk</i>	<i>Constellation</i>	<i>Ranger</i>	
Total number of carriers in commission	13	14	15	15	15

To maintain a 15-carrier force, a new carrier must be started on the average of every three years, if a 45-year service life is assumed, or every two years for a 30-year service life. To maintain series production in the Newport News yard (the only carrier-building yard used by the Navy in many years), the next carrier should be started by FY 1991, with long-lead funding provided in FY 1989 and FY 1990. The most efficient funding profile would incorporate a multiyear contract similar to the one negotiated in FY 1983.

Production of a new carrier was programmed for 1988 in the FY 1984 Five-Year Shipbuilding Plan reported to Congress in February 1983. This ship was deleted, according to the media, because of congressional objections. A carrier started in FY 1988 could be delivered in FY 1993 or 1994.

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Deletion of the FY 1988 carrier start by an administration that supports the 15-carrier goal is not reassuring to carrier advocates. A rumor that the start is only postponed does not help much. A start later than FY 1988 might preserve series production in the yard, but it extends the gap between deliveries of modern carriers, the consequences of which are unpredictable.

These scheduling and funding facts of life are well understood within the Office of the Secretary of Defense and on Capitol Hill. The absence of any programmed carrier start for the next five years raises serious doubts about the viability of the 15-carrier goal and provides comfort to those who challenge it. Once that controversial goal is successfully challenged, the number of battle groups to be funded in peacetime is highly debatable. Since the battle group is the Navy's fundamental force-structure building block, such an outcome could have a profoundly adverse effect on the allocation of the Navy's resources and ultimately, in the Navy's warfighting capability.

Modernizing the Air Wings

F/A-18 Hornets are being procured to replace F-4s and A-7s in carrier air wings. Pilots who have flown the Hornet like it. Navy planners have already started to experiment with the flexibility the new airplane brings to air-wing composition. Given this favorable reaction to the F/A-18 as a fighter-bomber able to fill both the fighter and light attack roles, the remainder of this section is devoted to examining Navy planning to keep other air-wing functions technologically current in the face of an ever-more-sophisticated threat.

F-14 Upgrade. The F/A-18 has only limited capability in the outer air battle, the first layer of the three-layered fleet air defense zone. For the outer air battle, the chosen instrument is the Phoenix-firing F-14, which currently performs acceptably within a fleet air defense perimeter of 200 to 250 miles. Projected threat advances dictate extension of this perimeter. After studying the matter, Navy leadership decided to improve the F-14 while developing a new airplane to meet the more formidable threat projected for the 1990s and into the twenty-first century.

The F-14 upgrade has two versions. The F-14A(plus) will have a new, more fuel-efficient engine capable of 30 percent greater thrust than the presently installed engine. The F-14D will receive the new engine, digital avionics, and an upgraded radar. The modernized avionics package will not only improve the airplane's capability, but

also make it compatible with other modern Navy and Air Force battle-management systems. The new radar will have a greater signal-processing capability and promises to be more reliable and easier to maintain.²

New F-14A(plus) aircraft will be purchased in FY 1986 for delivery in FY 1988. Production money for the first F-14Ds is programmed for 1988, with first delivery expected in FY 1990. With design work and engineering development complete on both the F-14A(plus) and the F-14D, the Navy will be in a position to purchase new F-14Ds while backfitting engines into old F-14As to convert them into the F-14A(plus). The Navy has announced plans to accomplish the first stage of this retrofit. About 295 F-14s will be upgraded to F-14Ds. The final inventory objective will depend on whether the weapons system can be upgraded sufficiently to meet projected end-of-the-century threats, and whether the Advanced Tactical Aircraft (ATA), to be described later, can be designed to perform both the air superiority and all-weather attack roles.

A-6 Upgrade. The A-6 provides all-weather attack capability with either significantly more payload or almost twice the unrefueled attack radius of the F/A-18. To retain these capabilities in the air wing, Navy leaders have chosen to modernize the A-6 while designing a replacement for this aging aircraft. An alternative, rejected for now, would have been to provide an all-weather capability for the F/A-18 and accept the lesser range-payload capabilities of that aircraft.

Aircraft age is not the only problem forcing a decision about the A-6. If the Navy succeeds in acquiring and maintaining 15 carriers, there could be an A-6 inventory problem by the end of the 1980s. But there are many variables and many solutions to that contingency. For example, a decision is in the making to drop KA-6D tankers from the air wing and rely on attack planes and possibly ASW planes, configured with buddy stores, for the tanker function. If this is done, the KA-6Ds could be reconverted and modernized to extend the A-6 inventory. Some analysts recommend replacing all Marine Corps A-6 squadrons with F/A-18 squadrons and returning the Marine Corps A-6s to the Navy. These expedients would delay an A-6 inventory shortage a few years. Finally, the A-6 production line remains open and additional aircraft could be procured, but this option is attractive only if the production line is producing an upgraded and more reliable aircraft. It is likely that more than one of these options will be pursued over the next 15 years.

The A-6 upgrade (A-6F) is similar to that of the F-14 (F-14D). A new engine, digital avionics, and new radar will give the A-6 a new lease on life. As in the F-14 upgrade, the A-6 program takes advantage of modern technology to improve reliability and maintainability. But the emphasis on these benefits is much greater in the A-6 upgrade. The A-6 upgrade will also add the capability to employ Sidewinders or advanced medium-range air-to-air missiles (AMRAAMs).³

Improved survivability is another major goal. Loss of an A-6 to ground fire in Lebanon in 1984 prompted complaints about the aircraft's viability; such complaints have been raised before but have lain dormant in recent years. Given the increasing effectiveness of precision-guided air defense weaponry (exemplified by the U.S. Navy's Aegis weapon system), the lack of emphasis on standoff air-to-surface weapons by U.S. naval aviation, and the poor survivability inherent in the design of the A-6, critics question whether enough will be done in the upgrade to justify the expense. More importantly, they question whether the A-6 should be considered a first-line aircraft any longer. Specifically, they argue that if the U.S. Air Force needs the B-1 to replace the B-52, which is thought to be too vulnerable to Soviet air defenses, the Navy should not rely on the A-6 for the same kind of mission. Navy spokesmen counter that the A-6 will take advantage of its all-weather capabilities and deceptive tactics to reach its targets.

With first delivery of the A-6F scheduled for FY 1990, uncertainty still exists concerning retrofit plans. It appears the Navy will be relying mainly on the present A-6 model for many years to come.

Advanced Tactical Aircraft. Upgrades for the F-14 and A-6 aircraft have become necessary because no follow-on aircraft are in the acquisition pipeline. Planning for such an airplane is getting started under the designation Advanced Tactical Aircraft (ATA), first funded as a new line item in the FY 1986 Program Objectives Memorandum (POM). Although the direction of the planning is far from clear, there is some indication that, like the F/A-18, the ATA will be designed to perform both as a fighter and as an attack plane. Whether it would perform both these functions primarily with standoff weapons, which seems feasible, is uncertain.

A reasonable delivery date for new-design replacements for the A-6 and F-14 is the late-1990s. Some Navy planners are reluctant to embark on the design of a new generation of first-line aircraft now because they believe the necessary system components and subcomponents to design an advanced-technology replacement for either

aircraft are not well enough advanced in the research and development (R&D) pipeline.

Conceptual studies for this aircraft must resolve several significant questions relating to the future conduct of air warfare:

- How will stealth technology influence air warfare?
- How should standoff air-to-surface missiles figure in defining characteristics for sea-based attack aircraft?
- What air-wing reach is required for carrier safety?
- What radius is required for the air-defense perimeter?
- Should the new aircraft have a "forward pass" capability to enable them to share their outer-air-battle responsibilities with long-range surface-to-air missiles (SAMs)?
- What should it cost, considering the need to fill out air-wing structures within reasonable budgets?

These issues must be resolved now so that the R&D program can support whatever decisions are made. Otherwise, the next generation of aircraft may well end up looking very much like the present one by default, instead of as a result of conscious decisions.

Despite some controversy, Navy proposals to modernize and upgrade the F-14 and A-6 have been accepted by the administration and funded by Congress. Some analysts worry, however, that the follow-on program for these first-line aircraft has been delayed too long. They argue that there is a limit to the technological modernization possible in any system, especially in an aircraft, and that despite the vigorous modernization efforts these two airplanes will experience over the next few years, they may, like *Midway* and *Coral Sea*, be beyond upgrading to meet the threat before replacements can be designed and bought.

E-2C Update. The E-2C, which fills the airborne early-warning and fighter-direction roles, was introduced in 1973. It is due for an update, and one is planned to increase its computational capacity and make it compatible with Army and Air Force battle-management systems. A more fuel-efficient engine will increase its stay time, and improvements to its radar are also planned. Airborne early warning,

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surveillance, and targeting capabilities integral to the battle group are thus ensured for the near term.

As noted earlier, threat projections dictate expansion of the battle group's air defense perimeter by the 1990s. How this requirement will affect the E-2C's future is not yet clear. The debate concerns whether the integral battle group capability can be enlarged to expand the air defense perimeter, or whether it will become necessary to rely on some means external to the battle group, not necessarily controlled by the battle group commander.

ASW Aircraft. The S-3A fixed-wing ASW aircraft now assigned to the air wings is a relatively new airplane, serving acceptably, and due to begin a weapon system improvement program to an S-3B in FY 1988. The SH-3 helicopter, the Navy's standard carrier-based helicopter since 1961, needs to be replaced, but there was no agreement on its successor until Congress, in the FY 1985 DoD Authorization Act, directed design of a carrier variant of the SH-60 LAMPS helicopter.

Standoff Weapons. The AIM-54C, the most recent model of the Phoenix missile, has begun entering the inventory for an initial operational capability of FY 1985. A formal need statement for a follow on to the Phoenix, designated the advanced air-to-air missile (AAAM), was initiated in March 1984. The AAAM would complement the advanced short-range air-to-air missile (ASRAAM) and AMRAAM programs, already initiated, to cover the full envelope of air-to-air weapons. The AAAM, the advanced surface-to-air missile (ASAM), and forward pass are all under study to determine technological requirements and options for commonality among systems.

A temporary operational requirement is being processed within the Navy for an advanced strike/interdiction weapon system to give Navy attack planes greater standoff capability for survivability. The current inventory includes only short-range weapons (less than 100 miles).

Summary of Navy Planning for 15 Carriers

This survey of Navy planning to obtain and maintain 15 carriers and air wings suggests that the Navy has assumed a holding position after the development of the F/A-18. No new carriers are programmed despite the pressing need to continue building them if the 15-carrier goal is to be realized. The Navy's Sunday punch, the A-6, and the primary fleet interceptor, the F-14, are being modernized rather than

replaced because new-design aircraft are not available. Standoff weapons programs are barely in the conceptual stage, and the means for expanding the battle group air-defense perimeter has not been decided.

This holding pattern may have been dictated by politics (for example, awaiting the aftermath of the 1984 elections) or it may reflect more fundamental issues within the Navy and OSD over the future direction of sea-based air. The final section of the paper will examine some of those issues.

The Issues

Smart munitions are raising the price of doing naval warfare in the old way, whether that price is measured in effort expended to reach the target, in increased defensive measures required to prevent attrition of our own forces, or in the cost of the weapons systems themselves. As the preceding discussion indicates, our peacetime Navy leadership has had a problem convincing successive administrations and the Congress that sea-based air is still worth the price, even though that price gets higher all the time.

Earlier, several issues raised by the Navy's critics were identified. Here, these issues are examined under two headings as follows:

- **Force-level issues**
 - The peacetime force-level objective
 - Sea-lane defense and land battle support characteristics
- **Warfighting issues**
 - Aircraft carrier survivability
 - Air-wing effectiveness
 - Nuclear land-attack capability.

Force-Level Issues⁴

Navy leadership has had a 15-carrier goal since 1974 (earlier, the goal was higher). Yet, national leadership has not always accepted it. During much of the administrations of Presidents Gerald Ford and

Jimmy Carter, the programmed (and budgeted) goal was 12 carriers. Congress by and large accepted their positions on the matter. Though the Reagan administration has supported 15 carriers, most critics of the administration's defense spending challenge naval expansion in general and the buildup to 15 carriers specifically as examples of needless expense.

Nations do not maintain full mobilization in peacetime. They adopt a more relaxed defense posture appropriate to a reduced likelihood of military operations, but with due regard for the need to deter military adventurism by their adversaries. In peacetime, differences of opinion arise concerning the likelihood of military operations and the level of preparedness needed to deter aggression. These require subjective judgments, so the "right" answer to the question, How much is enough? is unknown in peacetime. The peacetime carrier force level is part of the general issue of preparedness.

In the United States, peacetime force levels depend on complex political and economic relationships in addition to purely military considerations, and even in times of greatest tension force levels do not approach the size needed for a long war. The Joint Chiefs of Staff (JCS) estimate the wartime "requirement" and make it known to responsible officials. The peacetime force level to be maintained in active status is then determined during the annual budgetary process, which includes the legislative as well as the executive branch. The gap between the two becomes the mobilization requirement. Each of these three numbers is involved in any analysis of the suitability of whatever peacetime force level may be under consideration.

Peacetime Force-Level Objective. The peacetime force level is supposed to meet peacetime rotation requirements and provide sufficient wartime capability to accommodate attrition and hold out until augmented by a mobilized reserve and the output from the industrial base (reactivations, conversions, or new constructions). A nominal planning factor of three to one is often used to figure the rotation base requirement. Theoretically, this ratio would permit manning peacetime overseas deployment stations and provide enough time off station to perform the maintenance and training needed to maintain readiness for wartime assignments.

By this reasoning, 12 carriers can man four overseas stations, 15 can man five, and so on. But for carriers, the three-to-one rotation has been a fiction for most of the past 20 years because of more intensive employment of the carrier force to meet contingencies. Based on that experience and given the actual deployment cycle and the real

overseas stations to be filled, a planning factor of four to one would come closer to providing an employment schedule that would meet maintenance and training objectives and deployment requirements.

For the past several years, the Navy has advertised "flexible" deployment as an excuse for occasionally leaving traditional deployment stations unfilled to ease rotation schedules. This terminology responds to the politics of the situation, and the practice may actually make better peacetime use of our limited number of carriers. But it does not answer critics who would deactivate some of the carrier force to save money, and who believe the number of deployed carriers should be a function of the peacetime force level rather than the other way around. The 12-carrier goal of the Ford and early Carter years represented that line of thinking.

According to Navy witnesses to Congress, 15 carriers are the "minimum prudent risk level." Media reports suggest the JCS would prefer about 24 carriers for the initial phases of a war.

During the first year of World War II, the U.S. lost four of its seven pre-war aircraft carriers. If similar attrition occurs in a war with the Soviets, six or seven of a 15-carrier force (or ten of a 24-carrier force) would remain after the first year. Whether World War II attrition figures are a good benchmark 40 years later is debatable, but that is an issue that will not be treated in this paper.

The pre-World War II number corresponding to today's JCS requirement for about 24 aircraft carriers was 18. By war's end, the U.S. Navy was operating about 100 carriers of all kinds. Although the U.S. Fleet during World War II was considered a two-ocean navy, it shared responsibility for the Atlantic and Mediterranean with the British navy, which also had more or less full responsibility for the Indian Ocean and the Cape route. Although the strategic situation and the players are different today, the magnitude of the sea-lane defense mission for the U.S. Navy in a global war would not be smaller than in World War II.

This highlights the significance of the dispute over whether a war at sea with the Soviets could be limited to the North Atlantic. The Navy's position and planning assume a global war; however, some analysts believe such a war could be confined to one theater. Whether or not the JCS carrier requirement reflects the Navy's position, that requirement is so large that few believe it can be attained in peacetime.

The disparity between the JCS requirement and the peacetime force-level objective is a two-edged sword. Because it exceeds the number of carriers likely to be built during peacetime, it can be used to

support any peacetime force-level objective that may emerge from the resource-allocation process of the executive branch. At the same time, because any approved peacetime force-level objective will be manifestly lower than the JCS requirement, it is sometimes argued that somewhat fewer carriers than the administration has requested will not make much difference.

In either case, there remains the question of how the peacetime force can be made to grow to the required wartime level should a war break out. Since there are no carriers in the Naval Reserve Force, the gap would have to be made up by reactivating mothballed carriers, converting existing ships, or constructing new ships. For various reasons, analysts worry that these options will not be sufficient to meet the mobilization requirement in time. Uncertainty over the mobilization base creates pressure for a somewhat higher peacetime force-level objective than would otherwise seem prudent, because the peacetime force will have to wait longer for augmentation by the shipyards.

In the absence of a significant change in perception by the American public of the Soviet maritime threat, the active peacetime force of fully effective carriers will probably remain in the range of 12 to 14 regardless of the Navy's force-level objective. This judgment is based on an assumption that the case for 15 carriers cannot be made compelling, because some administrations, both Republican and Democrat, have accepted 12 as the right number. Deletion of the FY 1988 CVN from the Five-Year Defense Plan (FYDP) suggests that the Reagan administration is not firmly committed to the 15-carrier goal. Taken in this context, the 15-carrier peacetime force-level objective, though arguably suitable from a purely military point of view, will probably not be found suitable economically or politically.

*Sea-Lane Defense and Land Battle Support Characteristics.*⁵ This issue is treated here as a force-level issue, because critics believe the land-attack requirement drives up the size of the carriers, the reach of the air wing, and the sophistication of the battle group defenses to such an extent that the Navy cannot afford enough battle groups to defend all the necessary sea lanes in the event of a war with the Soviet Union. Some aspects of the issue (the required reach of the air wing and the sophistication of battle group defenses) are given more detailed treatment in the section on warfighting issues.

The Navy has a mission to support the Single Integrated Operational Plan (SIOP). The ballistic missile submarine force has met this requirement since the mid-1960s, replacing carrier-based CTOL

aircraft that had supported the mission until then. In addition to the SIOP, the Navy has derived other land-attack missions from its fundamental wartime function to establish control of the sea lanes needed to prosecute an overseas war or to protect the flow of needed imports. According to Navy testimony to Congress, these missions could involve:

- Attacks on ports and shore facilities supporting enemy maritime operations
- Support of Marine Corps landings to seize territory strategic to sea control
- Support of other land battles if required (a collateral mission).

The 13 carrier air wings and some 137 planned Tomahawk platforms complement the SSBNs for these non-SIOP missions. In addition to these Navy forces, certain U.S. Army and Air Force capabilities can address the Navy land-attack mission, as shown in table 1.2.

CTOL critics rely on Navy testimony before Congress that:

- Large carriers are necessary to support the large air wings needed to deal with the high-intensity and sophisticated threat in Soviet defensive regions. Smaller carriers are not able to deal with this threat and are not cost-effective.
- The air wings need to have a long reach to give their carriers the relative safety of a long standoff range.
- Very sophisticated (and expensive) defenses—F-14s, Aegis cruisers, and destroyers—are needed to deal with sustained saturation attacks by missile-firing Soviet aircraft, ships, and submarines. Nuclear power contributes to CVN safety in a high-threat environment.

The result of these requirements is a \$16 billion to \$20 billion battle group. According to the critics, at that price the United States cannot afford enough battle groups to cover the sea lanes outside the high-threat regions, and may not even be able to defend the sea lanes near the European and Asian coasts and in the Mediterranean.

Table 1.2
Present Means of Meeting Navy Land-Attack

<u>Delivery system</u>	<u>Platform</u>	<u>SIOP</u>	<u>Missions</u>		
			<u>Sea-denial bases</u>	<u>Support Marines</u>	<u>Other land battles</u>
ICBM	Homeland	1	2		1
SLBM	SSBN	1	2		1
Sea-based air	Aircraft carrier	2	1	1	1
Tomahawk	SSNs and surface combatants	2	1		1
Naval gunfire	Surface combatants			1	
Land-based air (with ALCM)	Friendly territory	1	2		1
Land-based air (without ALCM)	Friendly territory	1	1	2	1
GLCM/Pershing	Friendly territory	2	2		1

1 = primary means, 2 = secondary means (not necessarily tasked).

Critics of the Navy's conventional land-attack planning argue that, as shown in table 1.2, against conventional targets in the Soviet homeland other, more appropriate means are available for all conceivable Navy requirements except support of amphibious assaults. Against adversaries other than the Soviets, they argue, the Navy would not face the intense opposition expected when attacking Soviet targets. (They acknowledge that British experience in the Falklands and our own experience in Vietnam have shown that opposition might be fairly sophisticated. But Third World nations are not able to mount sustained saturation attacks.)

According to the critics, these considerations indicate that difficult conventional targets in the Soviet homeland and sea-lane defense in the high-threat Soviet defensive areas should be assigned to the U.S. Air Force. The Navy could then build more affordable battle groups, including sea-control groups built around VSTOL carriers, and concentrate on missions where alternative means are not available, such as defending the sea lanes globally and projecting power in the Third World.

The Navy's position is that the United States should not surrender any part of the seas to an enemy by default, particularly the Norwegian Sea, the Sea of Japan, and the eastern Mediterranean Sea, which are included within the Soviet 2,000-km defensive zone.

They argue that, although land-based ASW air cover is effective and has been used often in the past, land-based AAW air cover has not been sufficiently responsive in past wars and we should not rely on it now. Therefore, Navy battle groups must be prepared to operate in the high-threat Soviet defensive zone to defend the sea lanes to our allies. Large, nuclear-powered carriers with their sophisticated defenses are needed whether or not the Navy conducts land attacks. The LHD 1 amphibious ship will be able to augment the large carriers, using VSTOL aircraft to perform sea-control duties in regions of less intense air threat.

Navy advocates argue that the Navy's land-attack missions are an outgrowth of its statutory requirement to be prepared to conduct prompt and sustained operations at sea. This includes the ability to neutralize enemy sea-denial forces by striking their bases. It also includes operations to seize advanced bases for our own sea-control forces. Although Air Force aircraft could perform some of these tasks, they will be fully engaged in their primary missions.

Naval aviation is part of the total U.S. tactical aviation capability that has been sized for the total tactical aircraft (TACAIR) requirement, including land-attack missions now assigned to the Navy. The Air Force could not accept reassignment of Navy land-attack missions without increasing its own TACAIR assets. Navy savings from such a mission transfer would logically have to be transferred to the Air Force to pay for these increased assets. Thus, no resources would be released to acquire more battle groups for expanded sea-lane defense operations.

The Navy arguments have been persuasive in the past and probably will continue to prevail in the future. It is generally recognized that there are some land-attack missions that could be performed only by sea-based aviation. Since Navy TACAIR must be acquired for those

missions, it is logical to take advantage of its flexibility and plan for its use in other appropriate assignments as well.

There still remains the real problem underlying the issue. There are not enough battle groups to cover all the sea lanes properly in a war at sea involving the Soviets. This is what people mean when they ask whether the Navy is pricing itself out of business. In light of the long lead time before wartime augmentation is possible, this problem deserves more attention.

Warfighting Issues

*Aircraft Carrier Survivability.*⁶ There are no invulnerable ships (or any other military targets). So the issue of carrier survivability is about cost-effectiveness. Specifically, does the cost of neutralizing or sinking a carrier favor the attacker or the defender? Cost in this instance is not necessarily measured just in dollars, though that is part of it. The U.S. Navy has done everything possible to raise the cost for the attacker. The carriers have been hardened and the effectiveness of active defenses improved at considerable expense. It is probably fair to say that the carriers in an alert battle group are the best defended of any military targets anywhere.

Nevertheless, critics believe the relative cost of neutralizing a large carrier now favors the attacker for two reasons. First, the increased cost of achieving much higher probabilities of kill with modern precision-guided munitions, particularly nuclear-armed ones, against large, expensive targets is relatively small compared to the increased cost of defending against those weapons. Second, neutralizing a carrier drastically curtails the utility and reduces the survivability of the whole battle group. They say the high cost of a battle group limits the number that can be acquired and maintained – thus, in effect, putting all the Navy's offensive eggs in too few baskets. The critics' recommendations to remedy this perceived problem are: (1) build smaller carriers so more can be afforded; and (2) distribute offensive capability into hulls other than carriers by arming ships with cruise missiles and vertical or short takeoff and landing (VSTOL) aircraft. Both these remedies promise to take advantage of dispersal to improve the probability that some offensive capability would survive.

The Navy offers several counterarguments to the dispersal approach. First, small ships are intrinsically less survivable than large ships. Whether there would be a net gain in survivability of battle group capability from dispersal depends on assumptions about cost and relative vulnerability that are themselves controversial.

Although it is not clear that dispersal helps or harms survivability, it is absolutely clear that dispersal costs more money. Second, the quality of VSTOL and cruise missile offensive capabilities is different enough from CTOL offensive capability (and from VSTOL and CTOL defensive capabilities) that comparisons are unreliable. Third, the Navy is pushing cruise missile and VSTOL development as rapidly as possible. For now, these options are available only to supplement our first-line CTOL aircraft.

The issue of carrier survivability thus usually transmutes itself into a tradeoff between size and number, to some extent because size is a proxy for cost. Arguments are arcane and not susceptible to objective analysis because assumptions depend on subjective judgments. The Pentagon during the Carter years chose a conventionally powered mid-size carrier, but Congress was persuaded to approve a large nuclear-powered one. Although the Reagan administration supported two large CVNs in FY 1983, it apparently is unwilling to go to Congress again for more.

The Navy undermines its argument for large carriers by continuing to operate *Midway* and *Coral Sea*, and to homeport one of them inside the Soviet high-threat defensive zone. With these ships in the inventory, maintaining that only large CVNs can survive sustained Soviet saturation attacks subjects the Navy to criticism that it is asking its crews to take risks they should not have to take. This inconsistency needs to be resolved before the next CVN is requested.

The issue of carrier survivability influences the outcome of the force-level dispute, and is, in turn, influenced by it. As the discussion of the carrier program showed, the rate of funding for new CVNs has fallen short of what is needed to sustain a 15-carrier force. The Navy can insist on large CVNs and probably have them. But, to repeat the conclusion of the force-level discussion, there are not enough carriers planned to meet prospective wartime needs.

Air-Wing Effectiveness. This topic covers four issues identified in the earlier examination of the Navy's plans for modernizing the air wings:

- Required air-wing reach for carrier safety
- Radius of required air-defense perimeter
- Division of responsibilities for the outer air battle
- The role of standoff air-to-surface missiles.