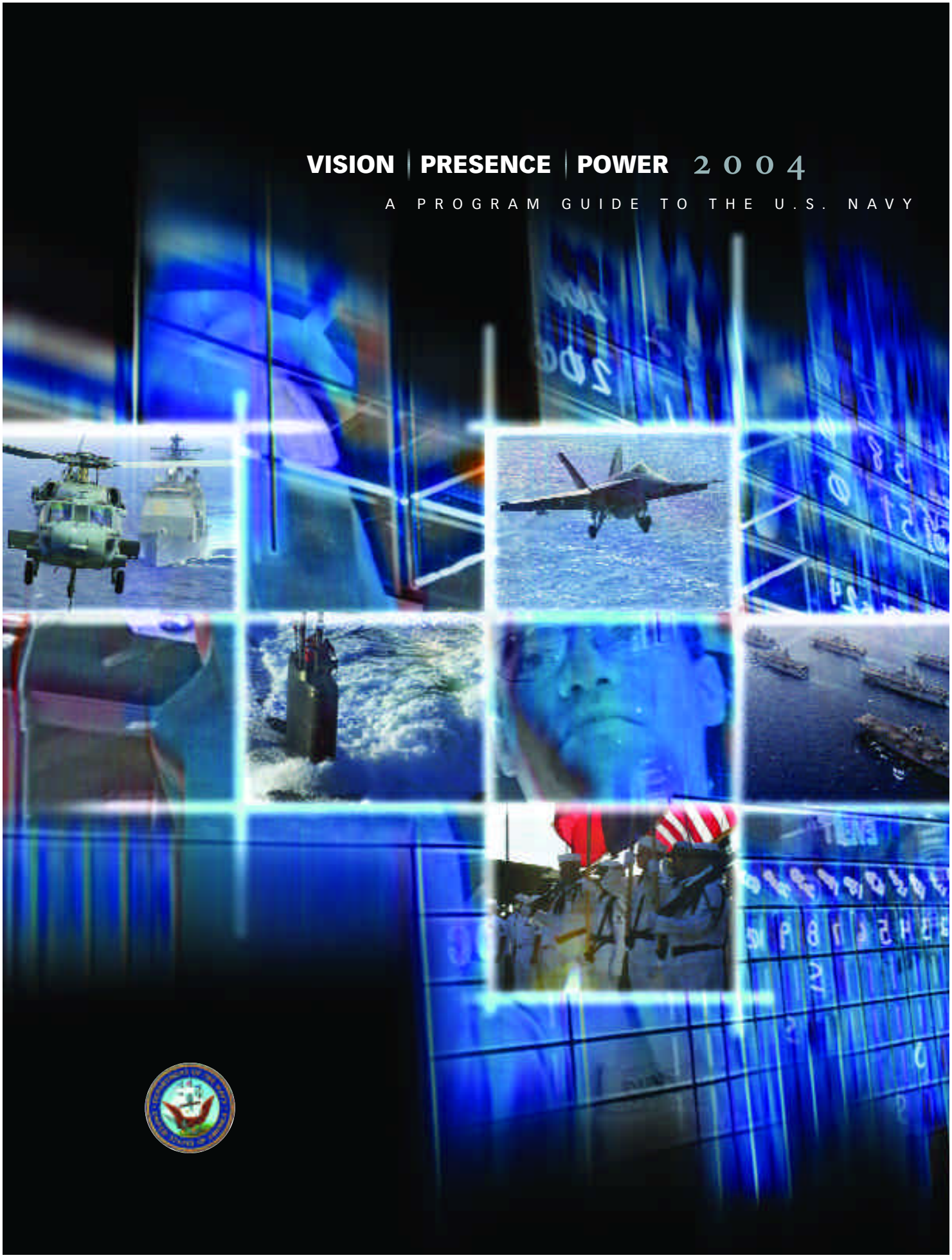

VISION | PRESENCE | POWER 2004

A PROGRAM GUIDE TO THE U.S. NAVY

FORE | WORD

Vernon E. Clark
Admiral, U.S. Navy
Chief of Naval Operations

Today, as throughout our history, the men and women of the U.S. Navy are defending freedom and promoting democratic values in a very dangerous world. Devoted Sailors serve on the point, often under arduous conditions, committed to achieving the Navy's mission and upholding America's ideals. At home and overseas, our people are a resilient, capable, and motivated force for peace. They are proud to serve, and they are at the heart of everything that is good in our Navy.

Our Navy has worked hard to prepare for an uncertain future and has made great strides toward realizing our strategic vision, "Sea Power 21." Working as an aligned, integrated team, everyone—from our civilian and uniformed leaders in Washington to the newest Sailors at sea—is contributing to improved Fleet readiness, professional and personal development, and innovative operational concepts, all of which are shaping our future.

We will continue to build upon the foundations of "Sea Power 21"—Sea Strike, Sea Shield, and Sea Basing—while also investing in our Top Five priorities: manpower, current readiness, future readiness, quality of service, and alignment. Our progress on these fronts is visible everywhere… Operations Enduring Freedom and Iraqi Freedom… our improved surge capability through the Fleet Response Plan… launching of the Navy's first Expeditionary Strike Group… broad successes in sea-based ballistic missile defense… These efforts and myriad others ensure the Navy can deliver credible, persistent combat power —the sovereignty of the United States—to the far corners of the Earth, anytime, anywhere, without a permission slip.

As testament to this capability, our brave men and women remain steadfast in their mission to fight the Global War on Terrorism, a difficult conflict that pits our Sailors against ambiguous yet lethal threats and enemies. That said, our own asymmetric advantages—advanced technologies, the best weapons and sensors, leading-edge ships and aircraft, dedicated Sailors possessing the winning combination of intelligence, capability, and persistence—will carry the day. These combined strengths, seamlessly networked with our Joint partners and projected onto the battlefield, ensure the Navy-Marine Corps Team will retain its asymmetric advantages in fighting conflicts today and tomorrow.

The 2004 edition of Vision… Presence… Power—the eleventh edition of this annual program guide—provides an overview of our Sea Power 21 strategy, investments, and the critical programs and initiatives that will enable the Navy to carry out its missions successfully, around the world and around the clock. I invite you to take a closer look at what your Navy is doing today and how we are planning for America's future.

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CHAPTER 1

ACHIEVING THE SEA POWER 21 VISION

World events since the attacks on two of our major cities have caused the United States to reassess a dramatically changed strategic landscape and to look closely at how our joint forces operate in support of national security at home and abroad. In contrast to the wars of the last century, tomorrow's battlespace will most likely be the littorals, the land-sea interface where more than 70 percent of the earth's population resides, whose waterways are teeming with commercial activity, and where an adversary can use asymmetric warfare to its greatest advantage. To win on this 21st-Century battlefield, the United States Navy must be able to dominate the littorals and to maintain assured access in critical world regions, ready to strike on a moment's notice—anywhere, anytime. This shift in paradigm has caused us to rethink our capabilities and their employment.

In his "Sea Power 21: Projecting Decisive Joint Capabilities" white paper released in October 2002 and reprinted in the 2003 edition of "Vision… Presence… Power," Chief of Naval Operations Admiral Vernon E. Clark articulated a U.S. Navy focused on three fundamental concepts—Sea Strike, Sea Shield, and Sea Basing—that are linked in a seamless FORCEnet web of secure communication and information, an overarching effort to integrate warriors, sensors, networks, command and control, platforms, and weapons into a cohesive network, enabling Sea Strike, Sea Shield, and Sea Basing to achieve maximum effect. Important for today's and tomorrow's fleet, "Sea Power 21" outlined a new Global Concept of Operations, now called the Fleet Response Plan, that posits innovative force-mixes—carrier strike groups, expeditionary strike groups, and expeditionary strike forces—that will enable the Navy to respond with speed and persistance in ways not possible today. "Sea Power 21" is thus providing the focus and framework to transform the U.S. Navy from a "Post Cold War" force to a fleet tailored for the ambiguous but still dangerous threats of the 21st Century.

"Sea Power 21" Operational Concepts ➢

Sea Strike ➢ expanded power projection that employs networked sensors, combat systems, and warriors to amplify the offensive impact of sea-based forces

Sea Shield ➢ global defensive assurance produced by extended homeland defense, sustained access to littorals, and the projection of defensive power deep overland

Sea Basing ➢ enhanced operational independence and support for joint forces provided by networked, mobile, and secure sovereign platforms operating in the maritime domain

Accelerating our Advantages

The Navy is preparing to use our own asymmetric capabilities to their greatest advantage. We are continuing to operationalize the strategic concepts of "Sea Power 21"—to accelerate our advantages over our adversaries by maximizing the joint and combined capability the Navy brings to the defense of the nation and our allies, coalition partners,and friends. We must be able to project and sustain broad-spectrum joint and combined capabilities from the sea,linked by a network of modern technology, and fighting from a common operating picture, with longer reach, greater endurance, and finer precision than has ever been possible in the history of the world. Our approach has been designed from the keel up to operate in partnership with our sister services—including the U.S. Coast Guard in the Department of Homeland Security—and overseas partners, because winning the War on Terrorism demands nothing less.

The past year has presented several clear demonstrations of the value of naval forces being ready to project decisive offensive and defensive power anywhere at any time in a world that will continue to be characterized by dangerous uncertainty and conflict. The performance of our Navy in Operations Enduring Freedom (OEF) and Iraqi Freedom (OIF) has reaffirmed the value of readiness in many ways,especially the readiness to surge whenever the need arises, while continuing to provide forward-deployed forces for enhanced regional deterrence and contingency response. Our performance in these operations, in concert with the other military services and the forces of the Coalition of the Willing, has reaffirmed beyond any doubt the real value of expeditionary forces in dominating a unified battlespace.

The Navy's ability to maneuver in the global commons—sea, space & cyberspace—provides the President and the U.S. Combatant Commanders the necessary options to project persistent, credible combat power to the far corners of the earth, at will. The remarkable speed of advanced of our coalition forces in Iraq, despite the severe limitations posed by geography and terrain, was due in no small measure to the extended reach of modern expeditionary maneuver warfare in providing decisive warfighting capabilities from the sea. That enormous success spurs us onward to realize the full potential of "Sea Power 21," to align, organize, integrate, and transform our Navy to meet the challenges ahead.

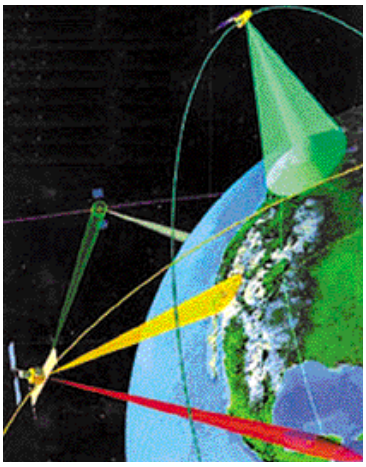
Increasing the Pace of Innovation

Increasing the pace of innovation is key to accelerating our advantages over our adversaries and to succeeding in the War on Terrorism. Readiness, advanced technology, the maritime domain,and the genius of our people are the asymmetric advantages that we must fully exploit in order to realize the nation's first priority in this new century.

Perhaps our greatest challenge in that effort will be to move "Sea Power 21" from vision to reality. The Navy's strategic planning process provides the link between "Sea Power 21" and the Department of Defense's (DoD) Planning, Programming, Budgeting, and Execution (PPBE) process. Through careful, deliberate strategic planning, we are making crucial choices based on well-defined priorities to ensure that our future capabilities meet the requirements. Our top five priorities will remain unchanged in the coming year, although the emphasis on any one of them may change from time to time:

- **Manpower**
- **Current Readiness**
- **Future Readiness**
- **Quality of Service**
- **Organizational Alignment**

Our accomplishments during the past year in attending to those priorities give a clear indication of the degree of importance that we have placed on them. For example, we achieved remarkable combat excellence in OEF and OIF; we improved our surge capability; set records in recruiting and retention; gained closer alignment to the vision of "Sea Power 21" and harvested savings for recapitalization. More importantly, our five priorities will also give a clear indication of our success in the future.



Manpower

While we continue the War on Terrorism, we are also still fighting the "battle for people"—and winning. Last year, we continued to increase our emphasis on mentoring, strengthened our commitment to diversity, and capitalized on the continuing revolution in the training and distribution of our people. We also provided Sailors the opportunity to compete on their merits for select jobs in duty stations around the world. The results of these and other initiatives are compounding daily. For the third straight year, we experienced the highest retention rate in our history—more than 60 percent of first-term re-enlistments. We have met or exceeded our recruiting goals every month for the past two years,and the caliber of new recruits has increased,based on the number of recruits with at least a high school education.

The battle for people will never be won completely, however. While we recognize that people are our greatest asset, we realize that manpower is never free. Sailors have chosen the lifestyle of service to make a difference. Our ability to provide them Quality of Service—meaningful, challenging work and the level of contentment that enables them to make a difference—is part of what we have termed "covenant leadership." We are committed to enhancing their professional growth and development,improving

their productivity, and eliminating unnecessary billets. We are committed to building a Navy that will maximize the capabilities of our people and minimize the size of our payroll. As our Navy increases the use of high technology, our workforce must become smarter, but smaller in number.

We cannot be content to rest on our past successes. We will continue the fight for talent in a very competitive market. We will continue to reshape the workforce to meet the demands of "Sea Power 21." We will ensure that every Sailor has the opportunity and resources to successfully compete for their choice of assignments. We have established Task Force WARRIOR to accelerate the integration of manpower, personnel, and training systems that will deliver Sea Warrior to the fleet. Sea Warrior is the program designed to enhance the assessment, assignment, training, and education of our Sailors. Our goal in each of these efforts remains to attract, develop, and retain highly skilled and educated warriors, who will be necessary to lead the 21st-Century Navy.

Current Readiness

The combined power of our forward-presence forces and our ability to surge assets on a moment's notice has either defeated our adversaries or kept them on the run, which is precisely what we set out to do. During FY 2003 and into FY 2004, we have invested billions of dollars in training, maintenance, spare parts, ordnance, flying hours and steaming days. That investment has returned the best readiness levels in recent history. We have been able to commit more than half the Navy to combat ready response in operations throughout the world. Seven aircraft carriers and nine large deck amphibious ships were among 164 Navy ships to deploy worldwide. The Military Sealift Command provided more than 200 ships to move 94 percent of the nation's joint and combined capability to the fight in Iraq and Afghanistan. We also deployed three fleet hospitals, a hospital ship, 22 P-3 Orion aircraft, and 25 Naval Coastal Warfare (NCW) detachments.

We live in uncertain times. The United States needs a Navy that can provide homeland defense, deploy a force forward, and be ready to surge with overwhelming and decisive combat power. With this in mind, we launched the Fleet Response Plan (FRP) this past year. The FRP resets the force in a way that will allow us to surge about 50 percent more combat power on short notice and simultaneously. In simplest terms, rather than having only two or three Carrier Strike Groups (CSG) forward-deployed and properly equipped, and able to surge only a maximum of two more at any one time, the FRP now enables us consistently to deliver six forward deployed or ready to surge CSGs almost immediately, plus two additional CSGs in the basic training phase within 90 days. This FRP capability is commonly known as "six plus two."

To sustain the right kind of readiness to satisfy Fleet Response Plan requirements, we will continue to innovate and adapt our training and warfare doctrine to new ways of fighting. We are also seeking to gain closer integration with joint forces and to refine our training, maintenance, and inter-deployment readiness

processes to increase our operational availability. Among other initiatives, we are enhancing our strike capability with the deployment of expeditionary strike groups,and we have expanded our littoral warfare capabilities by realigning our Naval Coastal Warfare forces, establishing Mobile Security Force detachments, adding an explosive ordnance disposal unit to Commander, Naval Forces, Central Command (NAVCENT), and accelerating the planning for two new Naval Special Warfare (NSW/SEAL) teams.

Future Readiness

Operations in Afghanistan and Iraq clearly demonstrated the enhanced power, protection, and freedom afforded by the implementation of our "Sea Power 21" vision. These joint operations have been the most effective in our history. As we move into the future, however, we cannot rely solely on our successes of the past. We must continue to challenge assumptions and build on the lessons learned from previous history. Yet,it is clear from our experiences of the recent past that our "Sea Power 21" vision is on the right track to ready us for the future.

Sea Strike introduced capabilities that extended our reach, accuracy, and precision, providing Joint Force Commanders with a potent mix of weapons. The second and third F/A-18E/F Super Hornet squadrons deployed this year, providing greatly enhanced range,payload, and refueling capability to forces in Iraqi Freedom. The Shared Reconnaissance Pod (SHARP), the Advanced Targeting Forward-Looking Infrared (ATFLIR), the Joint Helmet Mounted Cueing System and the Multi-Functional Information Distribution System (MIDS) arrived in the Fleet and showed us the power of these new technologies. We also began the conversion of the first of

four *Ohio* (SSBN-726)-class Trident nuclear-powered ballistic missile submarines (SSBNs) into the "SSGN" conventional strike and Special Operations Forces platform.

Sea Shield helped strengthen and extend our defense capabilities to the joint force. The USS *Higgins* (DDG-76) provided early warning and tracking to help U.S. Army Patriot batteries defend Kuwait and southern Iraq from the threat of theater ballistic missiles. The USS *Lake Erie* (CG-70) and USS *Russell* (DDG-59) combined to acquire, track and hit a ballistic test target missile in space with a developmental Standard Missile-3 (SM-3) in support of the Ballistic Missile Defense program. The Chief of Naval Operations established Task Force ASW (Anti-Submarine Warfare) to study improvements in Anti-Submarine Warfare readiness, enhance our ASW capability, and ensure access for joint forces moving from the sea to objectives inland. Task Force HIP POCKET demonstrated dramatically improved close-in defensive systems for surface ships in the near-littoral environment.

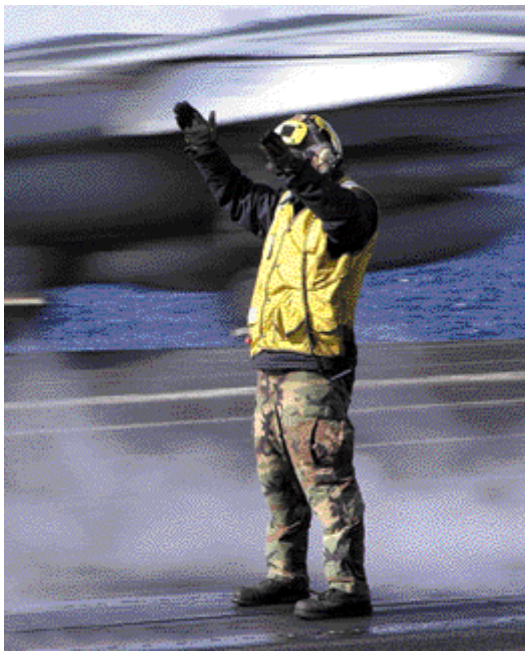
Sea Basing became a more tangible reality with the award of three preliminary design contracts for the Littoral Combat Ship (LCS),leading to the construction of the first LCS in FY 2005. We selected the baseline design for the next-generation DD(X) multi-mission destroyer, launched *San Antonio* (LPD-17) and *Virginia* (SSN-774) and began fabrication of *Makin Island* (LHD-8). The Defense Science Board study on Sea Basing, our Joint Forcible Entry study, and the Maritime Pre-positioning Force (Future) Analysis of Alternatives now nearing completion are all beginning to provide the information needed to define future sea based expeditionary operations.

FORCEnet initiatives have helped us further integrate the power of warriors, sensors, weapons, and platforms into a networked combat force. We established a framework for architecture and standards and promulgated the FORCEnet campaign plan. We developed and installed secure wide-area networks (WANs), in all of our deploying ships during FY 2003, making it easier for DoD forces and our coalition partners in different areas of the world to share information. We also partnered with the U.S. Army to develop a joint airborne platform for Intelligence, Surveillance, and Reconnaissance (ISR) to replace the aging EP-3E Information Warfare Aircraft based on the Orion airframe.

Sea Trial is up and running with the Fleet in charge and is already providing us with valuable insights into future tactics and technology. Commander Fleet Forces Command (CFFC) published the Sea Trial instruction and experimentation plan, which included the investigation of SSGN modular payloads in the Giant Shadow experiment in January 2003. The experimental high-speed vessel HSV-X1 conducted operations this past year in support of mine warfare and special operations during Iraqi Freedom. A second high-speed vessel, HSV-2 *Swift*, has been delivered and is conducting experimentation in support of "Sea Power 21" concept development.

Sea Enterprise is focusing headquarters leadership on output and execution and is creating ideas that will improve our productivity and reduce our overhead costs. The Sea Enterprise Board of

Directors established an enterprise-wide approach to transformation, validating $38 billion in savings across the FY 2004 Future Years Defense Plan and identifying $12 billion in new initiatives to help us recapitalize and transform the force. The CNO has conducted more than a dozen reviews of key commanders, those who report directly to the CNO, to examine products, processes, and budgets, and to attack overhead costs. Sea Enterprise principles are now taught in many of our executive, officer, and senior-enlisted training pipelines.



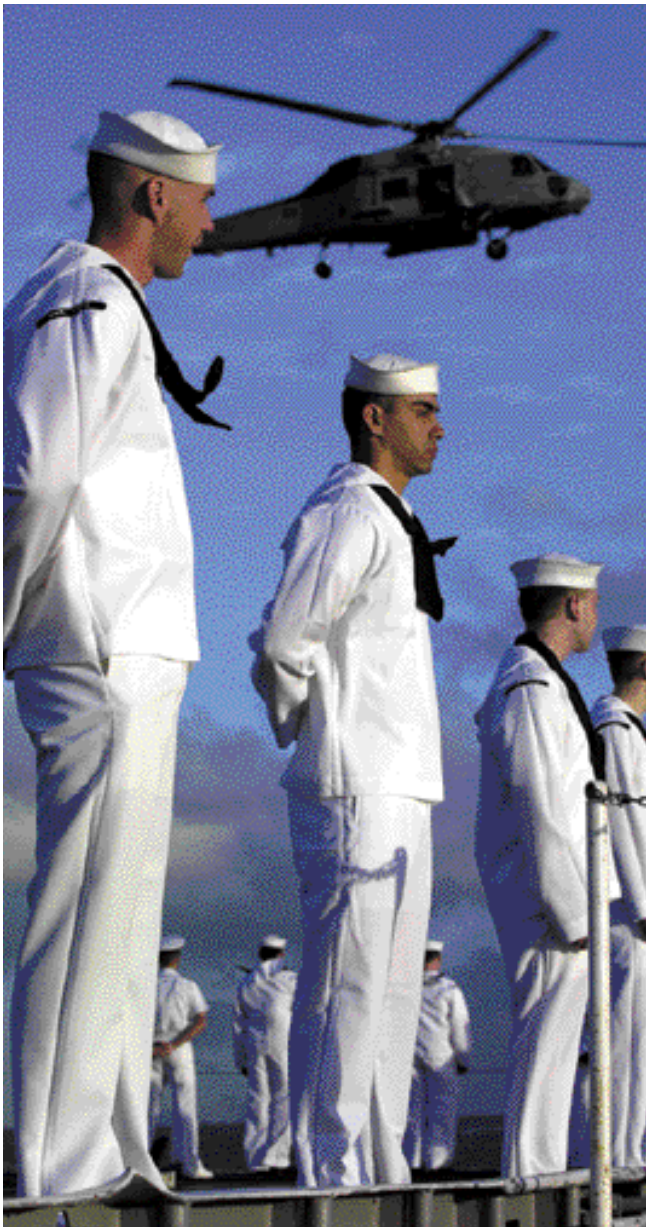
The tremendous improvements made in manpower and current readiness allow us to focus much more intently on the future—and future readiness. If we are to accelerate our current advantages, we must capitalize on revolutions in information, stealth and precision technologies and develop new warfare concepts that will lead us not just to improved joint operations, but true interdependence. "Sea Power 21" is our roadmap. This year, we will pursue distributed and networked solutions that could revolutionize our capability. We will focus on the power of the Sea Base and our complementary capability and alignment with the Marine Corps. We will exploit investments made in joint research and development wherever possible. We will enhance our capabilities investments and become a leader in defense modeling and analysis. Finally, we will continue to accelerate our advantages by increasing new ship and aircraft procurement in 2004.

Quality of Service

The battle for people includes ensuring an environment where sailors have confidence in themselves, in each other, in their equipment and weapons, and in the institution they have chosen to serve. This year, we continued the significant advances in compensation, in building the structure to realize the promise of the revolution in training, in transitioning to a secure interoperable network, and in strengthening the balance between safeguarding the environment and protecting national security.

For example, we began the creation of an Integrated Learning Environment. We developed the organizational structures needed to get the most from the Revolution in Training, such as the Director of Naval Training and Education (N00T), Naval Education and Training Command (NETC), Human Performance Center (HPC), Naval Personnel Development Command (NPDC), Naval Service Training Command (NSTC), 14 Learning Centers and three Training Support Centers. We incorporated the Five-Vector Model and Central Management System, which will soon be the primary career tool for all Sailors, into a pilot program for three ratings: Aerographers Mates (AG), Culinary Specialists (CS), and Information Technology Specialists (IT). These ratings will be the first to realize the benefits of a revolutionized personnel distribution system.

We also improved bachelor housing. We are on track to achieve the "1+1" Bachelor Housing



Standard, which is the new DoD standard that allows two residents to have private bedrooms with a shared a bathroom, kitchen, and living area. We also plan to eliminate community heads in bachelor housing ashore by FY 2007. We are also investing in Homeport Ashore to get Sailors a bachelor-quarters room off the ship.

Pay and compensation were also improved compared to previous years, increasing active-duty service member pay by an average of 4.1 percent, with targeted pay raises up to 6.25 percent. We extended the increases in family separation pay and hostile fire and imminent danger pay through 31 December 2004. We also increased Basic Allowance for Housing (BAH) to reduce average out-of-pocket expenses and help Sailors buy a stake in America.

Other quality of service issues are also under consideration. Task Force UNIFORM was established, led by the Master Chief Petty Officer of the Navy (MCPON), to assess the need for a cost effective and professional set of uniforms that recognize our naval heritage and prepare us for the future. Outdated sections of the Navy Uniform Regulations are under review and are being re-written. We will create an interactive web-based version of the Navy Uniform Regulations for online use. We have directed the pilot and testing of a working uniform for E-1 through O-10 and a year-round service uniform for E-6 and below.

Our emphasis on mentoring is a keystone in the bridge to a better career path for officers and enlisted members alike. Consequently, we have increased the availability of vital leadership references, including a Mentoring Handbook, through the Navy Knowledge Online website. Using multiple approaches, we took steps to ensure every Sailor has a mentor to maximize their talents and improve their contribution to combat excellence.

Sailors are the capital asset that makes our Navy without equal in the world. If we are to give full meaning to their service and, by extension, give full range to their talents, we must constantly strive to improve the quality of their work and the quality of their lives. In the coming year, we will fund technologies that reduce our manpower costs and make us leaner. We must ensure that every billet enhances combat readiness and that every job makes maximum use of the technology and tools available. We will strengthen our partnership with Navy families. We must deliver the training and education that deepens their contribution to the Navy and the nation, and assure that their life of service is honorable and rewarding.

Alignment

We endeavor to maintain the proper focus on operational excellence by establishing numerous initiatives that keep the Fleet at the center of all we do, that allow us to communicate better, and that enable us to be even more effective and more efficient in combat. One of the most important of those initiatives is to improve our alignment for joint warfare. Consequently we have now joined with the Marine Corps to integrate Navy-Marine Corps logistics functions, capabilities, and processes. We also recently signed the Naval Operating Concept, and began imple-

mentation of the Navy-Marine Corps Tactical Air Integration Plan. Perhaps most significantly, we defined the FORCEnet architecture with standard joint protocols, common data packaging, and strengthened security, redundancy, and alternate paths.

In order to increasingly align ourselves to a joint environment, however, it is vitally important to be aligned within our own organization. Consequently, we have enhanced our organizational and communications alignment. The establishment of Commander, Navy Installations Command (CNI) successfully merged eight installation claimants into one, reducing infrastructure management layers and integrating services. We capitalized on our existing forward-deployed naval forces in Japan to create a standing expeditionary strike group in the Far East. We reorganized Naval Supply Systems Command (NAVSUP), including the establishment of the Naval Operational Logistics Support Center to consolidate transportation, ammunition and petroleum management. The Naval Sea Systems Command (NAVSEA) has put in place multiple realignment efforts, including the establishment of a Warfare Systems Engineering Directorate, Human Systems Integration Directorate, and a POM (Program Objective Memorandum) Integration Group. Naval Aviation's requirements, resources, and material providers established the Naval Aviation Enterprise (NAE)—a partnership dedicated to delivering cost-wise readiness to the Fleet in support of Sea Power 21. Under the leadership of the Commander, Naval Air Forces (CNAF), the principal stakeholders are CNAF, the Air Warfare Division (N78), and the Naval Air Systems Command (NAVAIR). Finally, by October 2004, we will complete alignment of Fleet Forces Command with the warfighting fleet commanders.

Our goal in each of these initiatives is to enhance our mission accomplishment and deliver a combat-credible Navy now and in the future. That means focusing warfighting commanders on warfighting and improving our joint partnerships. It means developing a requirements process that recognizes the power of joint solutions and integration. It demands enterprise-wide approaches and innovation to achieve greater effectiveness and efficiency in afloat and ashore operations, readiness and infrastructure. At its most fundamental level, alignment ensures that we share a common understanding of the mission and objectives, and that we speak one message with many voices across the entire organization. We will continue to pursue organizational and operational alignment to ensure that our Navy is consistent and credible.

A History Unmatched… A Future Unrivaled

As we go forward, our purpose is firm and our strategic objectives are clear. For us, winning the Global War on Terrorism is our number one objective. Victory is the only acceptable outcome, and we are determined to achieve it.

We will deliver enhanced warfighting capability to the joint force, using the extended range and enhanced accuracy of naval weapons and sensors to reach farther and more precisely with greater striking power, to deliver broader defensive protection for joint forces ashore, and to leverage our command of the largest maneuver space on earth—the sea.

We will continue to improve upon the operational availability of fleet units, providing forward-deployed forces for enhanced regional deterrence and contingency response, while at the same time retaining the ability to surge decisive joint combat power rapidly in times of crisis.

We are creating a culture of readiness, and institutionalizing it throughout the service. However, readiness at any cost is not acceptable. We do not live in a risk-free world. Our leaders will assess risk and determine how to create a balance between excessive readiness costs and risk to mission accomplishment.

We will understand and attack costs at every level of our Navy. We will seek innovative means to improve productivity, leverage joint solutions, and achieve the improvements necessary to ensure both our combat readiness and our capability now, and in the future.

We will create an environment that attracts, retains and relies upon bold, creative, effective, and competitive people. We will foster a culture that cherishes these attributes and rewards them accordingly. We will invest in the tools, the information technology, and the training that delivers more meaningful job content to them because it is the Navy's men and women who offer us our greatest advantage. It is they who will ensure our legacy for years to come.

The U.S. Navy has an unmatched history of success. While we take great pride in our history, we are also careful to learn from it. Even so, we cannot consider all of our past practices to be the key to our future. Our greatest legacy, after all, is our heritage of innovation. To continue our legacy is to continue to re-evaluate our position and to challenge all of our assumptions. We will adapt to the changing world around us by getting out in front of it, by leading change, and embracing the innovations and improvements needed to guarantee our future success.

This 2004 edition of **"Vision… Presence… Power"** provides comprehensive information on how the Navy is making the transformation from vision to strategy and policy, the processes and key "players" by which the hard choices among various programs are made in an environment of still-constrained resources, and the specific programs—weapons, sensors, command-and-control systems, ships, and aircraft—that will ensure our Sailors and Marines have the right stuff for the tasks ahead.

CHAPTER 2

FROM VISION TO PROGRAM DECISIONS

The objective of "Sea Power 21" is to ensure that we possess credible combat capability on scene to promote regional stability, to deter aggression throughout the world,to assure access of Joint forces, and to fight and win should deterrence fail. Ensuring that this objective is met, and that emerging naval warfare concepts—Sea Strike, Sea Shield, and Sea Basing—for the 21st century are supported,is a complex,iterative, ongoing process that requires priorities be examined rigorously. The Chief of Naval Operations' top five priorities, which continue to guide our key decisions, are:

- **Manpower**
- **Current Readiness**
- **Future Readiness**
- **Quality of Service**
- **Organizational Alignment**

The CNO's annual Guidance and the prioritized Capability Objectives provide the links between vision and strategy, on the one hand, and the Independent Capability Analysis and Assessment (ICAA) and the CNO's Investment Strategy Options (ISO), on the other. Associated with this is the Naval Capabilities Development Process (NCDP), which places decisions within a capability-focused context. An important element in addressing new naval operating concepts—such as the Fleet Response Plan—and the technologies, systems, and platforms needed to carry out future roles, missions, and tasks, is the work of Navy Warfare Development Command, which reports to the Commander, Fleet Forces Command, in Norfolk, Virginia, and the Strategic Studies Group at the Naval War College in Newport,Rhode Island.In addition, the Navy's Fleet Battle Experiments, begun in 1997, have proven to be excellent vehicles for innovation and change that ultimately help to shape program decisions, and will continue to be a key element in the service's Sea Trial initiatives.

Fleet Battle Experiments

The Navy's Fleet Battle Experiments (FBEs) examine innovative warfighting concepts and emerging technologies and systems. They are true operational experiments in which failure is an option; there is important value in learning concepts that do not work, as well as those that show promise for the future. The service has conducted eleven FBEs through early 2004.

Fleet Battle Experiment Alpha, conducted in March 1997, used a sea-based Special Marine Air-Ground Task Force employing advanced technology and conducting dispersed operations on a distributed, non-contiguous battlefield. Some of the warfighting concepts included: sea-based command and control of operational maneuver; command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) capabilities for the Joint Task Force commander; advanced naval surface fire support; and theater ballistic missile defense.

Fleet Battle Experiment Bravo (FBE-B), conducted in September 1997, focused on the joint fires coordination process known as "Ring of Fire" and the Joint Task Force targeting process for Global Positioning System-guided munitions, including a supporting command-and-control architecture known as "Silent Fury."

Fleet Battle Experiment Charlie (FBE-C) was conducted in April-May 1998 during the USS *Eisenhower* (CVN-69) CVBG Joint Task Force Exercise, and addressed the Area Air Defense Commander and "Ring of Fire" concepts, in addition to the development of a Single Integrated Air Picture and air-missile engagements across a large area of operations.

Fleet Battle Experiment Delta (FBE-D), conducted in October and November 1998 in conjunction with Foal Eagle '98, an annual exercise sponsored by Combined Forces Command Korea, focused on four warfighting priorities: joint counter fire, joint counter special operations, joint theater and air missile defense, and amphibious operations.

Fleet Battle Experiment Echo (FBE-E), conducted in March 1999, employed both real and simulated forces and future concepts for command, coordination, communications, fires and

Navy Program Assessment and Planning

These service documents and processes are developed in conjunction with the Secretary of Defense's "Defense Planning Guidance" and, internal to the Department of the Navy, with the Secretary of the Navy's annual Planning Guidance. Implemented in Fall 2000 and carried forward in Fall 2002, a new organizational alignment within the Office of the Chief of Naval Operations (OPNAV) is helping to ensure the readiness and warfighting needs of our operating forces are met in the most efficient and effective manner possible.

To facilitate transformation from a threat-based to a capabilities-based planning process, the Deputy Chief of Naval Operations for Plans, Policies, and Operations (N3/N5) works with the Marine Corps to develop a prioritized list of warfighting capabilities based on the "Sea Power 21" construct. This list devolves the four Naval Capability Pillars (NCPs) of "Sea Power 21" (Sea Strike, Sea Shield, Sea Basing and FORCEnet) into more detailed Mission Capability Packages (MCPs) which are further refined into specific enabling capabilities. A panel of flag and general officers who represent the various mission and warfare areas then subjectively evaluates that list of capabilities, developed collaboratively by the Navy and Marine Corps. This panel—chosen for recent operational experience—employs an iterative process to compare capabilities and determine rank-order priority to the warfighter based on likely mission requirements in the future. The result is a list of prioritized capabilities, tied directly to the NCPs, that provides the NCDP with another input for determining the types and numbers of platforms entered into the program. This input complements the adequacy assessments that are conducted as part of the NCDP by the Director, Integrated Warfare Division (N70).

Planning and Programming

Innovation and transformation have characterized the Navy's program-planning process, certainly since the end of the Cold War but also throughout the service's history. In May 2003, the service put in place a modification to the Department of Defense (DoD) Planning, Programming, and Budgeting System (PPBS). This change was accomplished through Management Initiative Decision (MID) 913. This process, known as the Planning, Programming, Budgeting, and Execution (PPBE) process was designed to improve the overall effectiveness of the Navy's Planning, Programming, and Budgeting process by establishing a direct linkage from strategy to programmatic decisions through a single organization responsible for analysis of warfare capabilities while adding additional emphasis to program execution. The Prioritized "Sea Power 21" Warfighting Capabilities List provides a framework to establish the capability roadmaps developed by the Naval Capabilities Development Process. This new planning process is helping to ensure program synchronization, balance, and integration across all naval warfare areas, while remaining within fiscal constraints.

The resulting determination of requirements, allocation of resources, and responsive decision-making enables more flexible and timely responses in support of the combatant commanders and is the Navy's input to the Defense Department's Program Objective Memorandum and, ultimately, the President's budget submission to Congress. The OPNAV Alignment Plan, an evolutionary process that began in October 2000, has ensured that operational needs are met in the most cost-effective manner.

OPNAV Organizational Alignment

The continued pre-eminence of our Navy requires speedy and agile organizational responses to accommodate today's extraordinary rate of technological and other change. Organizational speed and agility are necessary both to counter risks to our future military preeminence and to take advantage of new opportunities. Rapid technological change means we must be able to quickly insert new technology, at reasonable cost,into our forces, systems, and processes.

Regardless of the actual size of the Navy's budget, we continue to function in a fiscally constrained environment—particularly as the full dimensions of the global war on terrorism have yet to be determined. Thus, we must extract the maximum advantage from the resources provided, and demand a high rate of return on our investments. For the Navy, "organizational alignment" means that our organizations,systems,and processes must deliver exactly what they are designed to produce: a combat-capable Navy ready to sail in harm's way. We can do that only if all Navy organizations are properly aligned to achieve our overall objectives. To that end, the Chief of Naval Operations initiated an alignment within the Navy's headquarters organization to represent better requirements generation and to ensure the proper focus on manpower and personnel requirements, as well as current and future readiness, a realignment that has continued to undergird the demands of our "Sea Power 21"strategy. (Figure 1 shows the realigned OPNAV organization.)

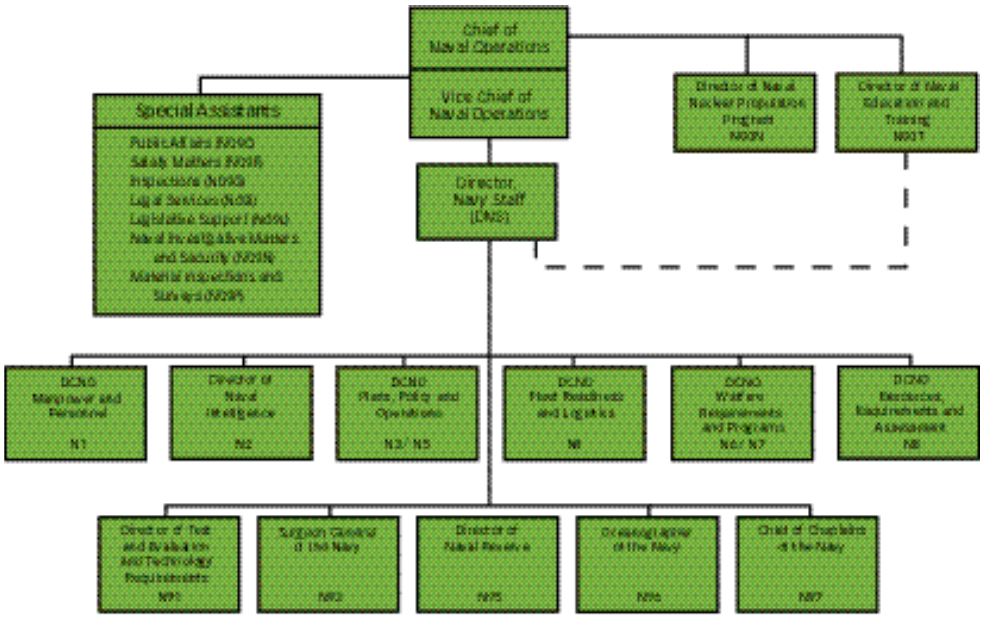


FIGURE 1
OPNAV Organization

sensors to address innovative operational concepts for defeating asymmetric threats, precision engagement, network-centric submarine warfare, information superiority, and casualty management.

Fleet Battle Experiment Foxtrot (FBE-F), a joint and combined exercise in the Arabian Gulf conducted in November-December 1999, examined the concept of assured joint maritime access in protecting air and sea lines of communication. The FBE addressed parallel operations using a Joint Fires Element to coordinate protection for in-stride anti-submarine warfare and mine countermeasures efforts to open a choke point. A Nuclear, Biological and Chemical Warfare cell assisted the Joint Task Force commander to respond operationally to a WMD threat.

Fleet Battle Experiment Golf (FBE-G), conducted in April 2000, assessed emerging technologies in a network-centric, joint and combined forces environment to support theater ballistic missile defense and time-critical targeting in the Mediterranean theater.

Fleet Battle Experiment Hotel (FBE-H), conducted in August and September 2000, focused on the application of network-centric operations in gaining and sustaining access in support of follow-on Joint operations. This FBE employed anti-submarine warfare, mine countermeasures, theater air and missile defense, and information operations, in conjunction with supporting strike and joint fires in an integrated operation targeted at anti-access, sea-denial forces.

Fleet Battle Experiment India (FBE-I), conducted in the San Diego op-area in June 2002, had the principle goal of operationalizing net-centric warfare. Testing a netted C4ISR architecture that provided participating Joint forces with wide-area connectivity, enhanced bandwidth, and "reachback" for enhanced situational awareness and decision-making, FBE-I addressed four main concerns: Joint fires, including time-critical targeting, in support of the Marine Corps' emerging concept of Expeditionary Maneuver Warfare; sustaining information and knowledge advantage; optimizing littoral anti-submarine warfare capability by establishing real-time connectivity with a submarine operating at tactical speed and depth; and far-forward casualty management and medical services.

These changes have established a strong advocate for fleet readiness, consolidated fleet-readiness requirements, established increased visibility into warfare programs, better integrated the Director for Training function into the Navy staff,and established a new decision-making process within the organization. The establishment of the Deputy Chief of Naval Operations (DCNO) for Warfare Requirements and Programs (N7), a vice admiral reporting directly to the Chief of Naval Operations, consolidated management of naval and Navy-unique warfare programs and generation of warfare requirements within one office. This organization was formerly contained within the Deputy Chief of Naval Operations for Warfare Requirements, Resources, and Assessments (N8). Fleet readiness requirements and assessments will be the responsibility of the Deputy Chief of Naval Operations for Fleet Readiness and Logistics (N4). Realigning and refocusing the Deputy Chief of Naval Operations for Logistics to the DCNO for Fleet Readiness and Logistics consolidates fleet readiness requirements and assessments in one office. The N4 organization will be the "Fleet's voice" within the Navy staff, more fully developing operational readiness requirements, and assessing whether these requirements are being met throughout the Navy's resource-allocation process.

The alignment has also extended to current planning, programming, and policy offices on the OPNAV staff for the Navy's training programs to provide a stronger link between fleet training and readiness. This reorganization will place responsibility for fleet and unit training requirements under the responsibility of the DCNO for Fleet Readiness and Logistics (N4). The former Director for Training organization (N7) on the Navy staff has been integrated into N7. The Chief of Naval Training and Education (N00T) will remain a vice admiral reporting directly to the Chief of Naval Operations. This has already proven to be an important element in fulfilling the recommendations of the CNO's Executive Review of Navy Training (ERNT), the ongoing efforts of Task Force EXCEL (Excellence through Commitment to Education and Learning).

Two other organizations on the Navy staff have been created to establish a strengthened decision-making process for major policy and resource allocation decisions. The CNO Executive Board (CEB) is chaired by the CNO or VCNO and brings senior leaders from the Navy staff and the operating forces together as a "board of directors." The role of this council is to advise the CNO and VCNO regarding decisions on key issues as well as providing a clear and unambiguous record of CNO decisions and direction on those issues. To enable debate, evaluation, and validation of new and competing program and readiness requirements, the Navy Requirements Oversight Council (NROC), chaired by the VCNO, serves to validate Navy requirements as well as provide the forum to prepare Navy positions to debate issues in the Joint Requirements Oversight Council (JROC).

Independent Capability Analysis and Assessment (ICAA)

A primary objective of the planning process is to develop a thorough understanding of how naval forces contribute to the nation's joint warfighting capabilities. In 1992, "...From the Sea" outlined four key operational capabilities—Command, Control, and Surveillance; Battlespace Dominance; Power Projection; and Force Sustainment—required to execute operations in the littoral. Today, the Navy's strategic planning guidance focuses on three overarching capability architectures that enable the projection of offensive and defensive naval power—Sea Strike, Sea Shield and Sea Basing—linked together by a seamless FORCEnet and carried out by Carrier Strike Groups, Expeditionary Strike Groups, Expeditionary Strike Forces, and other naval forces under a Fleet Response Plan by which U.S.strategy and policy are carried out. Within this conceptual architecture, the Navy's program planning process of the DCNO for Warfare Requirements, Resources, and Assessments (N8) relies on broad-based analyses that capture the complexity of naval warfare requirements while balancing them within available resources.

Starting from the capability objectives,current and future technologies,systems,and platforms are assessed against their desired effectiveness in the joint-service environment, a process that addresses the balance and warfighting capability of the planned force structure and support areas. The analysis and review of the "health" of the individual warfare and warfare support capabilities is an ongoing, iterative process,linked to the development of the Navy Program Objectives Memorandum and Program Reviews.

Warfare Capability Analysis

Sea Strike

Sea Shield

Sea Basing

FORCEnet

The number of ships, submarines, and aircraft in the Fleet is the most visible manifestation of the Navy's operational capabilities. The ICAAs assist Navy leadership in matching available resources with desired capabilities in the near, mid, and far terms. In addition to the numbers and types of ships, submarines, surface and amphibious warships, mine countermeasures vessels,aircraft,and special-purpose platforms,analysis considers lifecycle support, presence, and engagement requirements of the regional combatant commanders. Evolving threats, desired capabilities, developing technologies, doctrinal and operational concepts, and fiscal realities all play roles in shaping resource-allocation decisions leading to the naval forces the United States actually deploys. Force structure analysis examines the resources required to recapitalize or modernize the force, develop alternative force structure paths and subsequent consequences of the tradeoffs, and frame relevant issues via integrated decision timelines.

Fleet Battle Experiment Juliet (FBE-J), conducted July-August 2002, developed and refined command and control processes for future joint maritime forces. This included defining in detail the functions and planning process for the Joint Forces Maritime Component Commander, improving ship-based command and control, and enhancing the integration between networks and databases serving forward sea-based forces and those in the rear. FBE-J experimented in Joint Fires and Joint Sensor integration and employment with manned and unmanned distributed sensors over, on, and under the sea and over and on the land.The experiment specifically examined Mine Warfare, Anti-Submarine Warfare, Anti-Surface Ship Warfare, and overland strike operations using manned and unmanned platforms. One of the highlights of the event included experimentation with the joint high speed vessel (experimental) Joint Venture (HSV-X1). FBE-J was conducted under the overarching objectives of Millennium Challenge 2002 (MC-02), the congressionally mandated joint event designed to simulate a realistic future battlefield to assess the interoperability of new methods to plan, organize, and fight. MC-02 spanned three time zones and involved move then 13,500 personnel.

Fleet Battle Experiment Kilo (FBE-K), a joint warfighting exercise including both live field forces and computer simulation, was conducted April-May 2003 in various locations around the United States and the 7th Fleet Pacific area of operations. The experiment, conducted concurrently with Exercise Tandem Thrust 2003, developed and refined processes supporting joint command and control from the sea for future joint operations. There were a total of 11 transformational initiatives within FBE-K, all designed to combine experimental tactics, techniques, and procedures (TTP) with new technologies or existing technologies used innovatively. These initiatives included undersea warfare planning and C2 procedures, new technologies such as the Experimental Common Undersea Picture, and joint fires initiatives that experimented with a sensor-to-shooter fires network using simulated and experimental platforms as the shooter. FBE-K also tested a draft concept of operations for employing the Area Air Defense Commander System for joint theater air defense planning and operations.

In summary, our capabilities-based approach selects and prioritizes the proper capabilities to ensure strategic objectives can be satisfied in diverse future crises and conflicts, while at the same time focuses on meeting current requirements. Driven by warfighting and combat needs, but including the flexibility to assure, dissuade, and deter, these capabilities must also support Joint Force Commanders and work hand-in-glove with allied and coalition forces, be fiscally affordable, and provide a continuum of crisis-response and combat capabilities to support naval, regional combatant commanders, and national commitments. The force planning approach articulated in the Defense Strategy will guide decisions on the overall shape, size, and global posture of U.S. military forces to:

- **Defend the U.S.homeland and territory against direct attack;**
- **Operate in and from four forward regions to assure allies and friends,dissuade competitors, and deter and counter aggression and coercion;**
- **Surge globally to swiftly defeat adversaries in two overlapping focused military campaigns while preserving for the President the option to call for a decisive defeat in one conclusive military campaign—including the possibility of regime change and occupation; and**
- **Conduct a limited number of lesser contingencies.**

Sea Strike

The Sea Strike "pillar" includes naval fires and amphibious warfare, the latter perhaps more appropriately characterized as Expeditionary Maneuver Warfare. When naval fires are required, the joint task force commander will have a variety of naval weapons to choose from,including accurate stand-off munitions delivered from aircraft, gun-fired precision-guided munitions, and sophisticated ballistic and cruise missiles launched from surface warships and submarines. The essence of this capability is aircraft carriers equipped with long-range attack aircraft, surface warships, and submarines capable of launching a variety of responsive, accurate long-range missiles, and robust Naval Fire Support (NFS). In addition, the *Ohio*-class ballistic missile submarine, armed with the D5 missile system, provides the nation the most survivable leg of the nuclear deterrence triad and is thus a key element of the Navy's overall Sea Strike capabilities.

Expeditionary Maneuver Warfare includes the ability to mass overwhelming naval, joint, and allied military power and deliver it ashore to influence, deter, contain, or defeat an aggressor. Naval expeditionary forces provide the Joint task force commander with the ability to conduct military operations in an area of control extending from the open ocean, to the shore, and to those inland areas that can be attacked, supported, and defended directly from the sea. It is important to note that "littoral" operations are not "brown water" or "riverine"—today littoral operations can commence hundreds of miles from an adversary's coast, as was clear in Operations Enduring Freedom and Iraqi Freedom. Soon, with warfighting enhancements in the Fleet, the

Navy-Marine Corps team will be able to begin littoral operations more than 1,000 miles at sea. Navy and Marine Corps expeditionary forces—acting independently, jointly with the Army, Air Force,and Coast Guard, or combined with allied forces—provide the backbone of America's ability to project credible military power throughout the world, quickly and effectively.

Sea Shield

The Sea Shield ICAA integrates the alignment of the Joint Full-Dimensional Protection and Strategic Deterrence Joint Warfare Capability Assessments with the Sea Shield capabilities inherent in "Sea Power 21." This ICAA focuses on naval warfighting capabilities required to project defensive power from the sea, and assesses emerging technologies designed to extend naval defensive firepower far beyond the battle group to dominate the sea and littoral battlespace, project defense deep overland against cruise and ballistic missile threats, and provide the United States with a sea-based theater and strategic defense. In addition, Sea Shield enables the extension of homeland security to the fullest extent possible by including intelligence, surveillance, and reconnaissance assets; surface ships, maritime patrol aircraft, and ballistic missile submarines; and a mix of manned and unmanned systems operating on, above, and below the sea's surface.

Persistent supremacy of the sea and littoral battlespace continues to be at the heart of U.S.national strategy. Forward-deployed naval forces will assure access for the joint force through surface warfare and anti-submarine warfare superiority, air supremacy, mine countermeasures and the employment of naval mines in offensive and defensive operations.

Surface warfare superiority involves those actions necessary to neutralize an adversary's efforts to employ his surface warships against friendly forces. Antisubmarine warfare superiority includes capabilities that decisively neutralize or defeat an adversary's use of his submarines, thereby assuring access, permitting the use of the sea as a maneuver space, and allowing sea basing. Air superiority provides naval forces the capability of assured access to theater airspace by U.S. and coalition forces. Defensive Counter-Air (DCA) operations focus on maintaining air superiority with the capability to detect, identify, intercept, and destroy enemy air forces with aircraft or air warfare-capable surface warships before they attack or penetrate the friendly air environment. Sea mining and offensive/defensive mine countermeasures include those capabilities used to employ mines against an adversary's forces or to neutralize an enemy's efforts to use mines against U.S. or allied forces. Acting either independently or as a joint force component, naval forces provide capabilities that are critical to ensuring freedom of maneuver and power projection from the sea.

Sea Basing

The Sea Basing ICAA focuses on sealift, airlift, the Combat Logistics Force, transportation, and the ordnance inventory. It includes the capability to move items both intra-theater and inter-theater. It also includes the overall health of the Navy

ordnance inventory against combat, theater and homeland security, and training requirements.

The specific naval surface and air logistics functions that enable the movement and support of U.S. combat forces and other friendly forces afloat and ashore-remains an area of intense interest,and are the key to successful sea basing capabilities. In combat operations in the Arabian Gulf—from Desert Shield/Desert Storm in 1990 to Operation Iraqi Freedom in 2004—Operation Sealift transported 95 percent of all supplies and equipment to and from the area of operations. Limited access during Operation Enduring Freedom in Afghanistan in 2001-2002 was overcome by operations based and sustained from the sea. The Navy's strategic sealift fleet includes the Maritime Prepositioning Force (MPF), Army and Air Force Prepositioning Ships (APS), Surge Fleet, Ready Reserve Force, munitions ships, hospital ships and aviation maintenance ships. Commercial sealift assets may also be contracted to support specific mission requirements.

Prepositioned ships and surge sealift directly support Marine Corps Assault Echelon and Assault Follow-On Echelon operations, as well as Naval Construction Battalion (SeaBee) Force units. Sealift also carries Navy sustainment supplies and ammunition from storage sites to forward logistics bases where the Navy's Combat Logistics Force (CLF) shuttleships pick up and deliver this material to combatant forces at sea. Likewise, Sealift is vital to Army and Air Force regional operations, as the nation's land-based armed services are almost totally dependent upon the "steel bridge" of sealift ships to deliver everything a modern fighting force requires to accomplish its missions.

Sealift and the protection of in-transit ships by naval forces allow joint and allied forces to deploy and sustain operations, without dependence upon shore-side infrastructure in forward areas. In the near future,sea-based logistics assets will increasingly support emerging concepts for operational maneuver and ship-to-objective maneuver—the essence of Expeditionary Maneuver Warfare—and provide a full-spectrum of logistics, command and control, communications, and offensive and defensive fires for Joint Force Commanders.

FORCEnet

The FORCEnet team assesses capabilities underpinning network-centric warfare: communications and data networks; the common operational and tactical picture; and intelligence, surveillance and reconnaissance concepts,systems and programs. Many of these are key milestones on the Navy's transformational roadmap. FORCEnet capabilities are key to execution of effects-based operations in that they enable the commander to achieve

"Knowledge Superiority" over the enemy, exploit his weaknesses, and counter his strengths during rapid, decisive operations.

Warfare Support Analysis

Infrastructure

Manpower and Personnel

Readiness

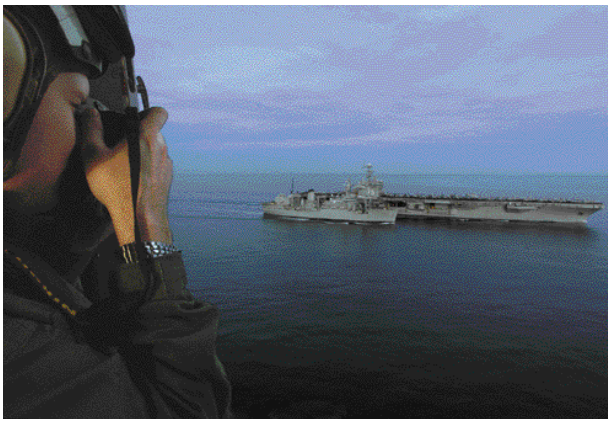
Training and Education

Infrastructure

While it seldom receives high visibility, infrastructure—bases, facilities, training areas, ranges, laboratories, buildings, piers, hospitals, and the like—comprises the essential framework for naval force readiness at home and abroad. Although it is not essential that the Navy have access to overseas facilities to carry out its worldwide missions, having facilities at key forward locations provides logistics support benefits and facilitates rapid response to threats and contingencies. Unlike other services, however, the Navy has the ability to bring its immediate logistics sustainment capabilities to forward operating areas. Beyond the first 30 days of conflict, advanced logistics bases provide fuel, ammunition, and maintenance sustainment support. Ashore infrastructure includes land, buildings, structures, and utilities within ports and air stations, repair and communication centers, storage and training areas, medical centers, and community support centers. This infrastructure is found at homeports as well as at advanced locations.

The Navy has a significant investment in in installations—more than $110 billion in plant replacement value. During the 1990s, this inventory did not downsize in similar proportions to the Navy's operating forces. Current maintenance, repair, and recapitalization rates are insufficient to maintain this infrastructure, much of which is inappropriate for 21st-century needs. Age exacerbates this problem—the average age of Navy buildings is more than 50 years, including numerous historical buildings maintained for heritage-preservation purposes. The Navy must shift its focus ashore from the current status quo to reshaping regional footprints and advanced logistics bases to ensure affordable, quality support for future naval operations.

Critical to sustaining readiness is our ability to train as we fight through continued access to ranges and operational exercise areas (OPAREAS).Our military training ranges are national assets that allow our forces to train in a controlled, realistic, and safe environment. But our ranges and OPAREAS are increasingly surrounded by urban development and subject to increasing environmental challenges that have begun to affect the Navy's ability to execute realistic training. The Navy is therefore implementing a fully integrated, systematic strategy that balances the dual goals of national security and environmental stewardship at our training ranges and exercise areas. Key to this training range sustainment effort is the Navy's commitment to the Tactical Training Theater Assessment Planning (TAP) initiative support-



ed by the "At-Sea Policy" and the Navy doctrine publication "Naval Warfighting" (NWP 4-11). With funding starting in FY 2004, the TAP initiative will provide a sound environmental range investment strategy for sustainable ranges/OPAREAS. This overarching sustainability program will seize the environmental high ground ensuring effective stewardship of the Navy's ranges/OPAREAS, allowing our forces to conduct realistic training in an environmentally sound manner. Accordingly, the Navy will continue to remain a good steward of the environment, while preserving the flexibility necessary for the Navy and the Marine Corps to train and exercise ashore and at sea.

Infrastructure also includes on shore capabilities necessary to support operational units. It includes the capability to provide waterfront and air operations; community support, including housing, medical, Morale, Welfare and Recreation (MWR), and child-care services; readiness support, including shipyards and Naval Aviation Depots (NADEPs); ranges; and shore force protection.Our challenge is to find ways to support an infrastructure that uses a smaller percentage of Navy resources while maintaining acceptable Quality of Service for our Sailors and their families,and force-wide readiness. The Navy will, therefore, support the additional Base-Realignment and Closure (BRAC) round in 2005, looking to shed excess and over-age infrastructure in a responsible manner and enhance operational readiness and our Sailors' Quality of Service.

The Navy's logistics transformation vision is captured in our High-Yield Logistics Transformation strategy. This strategy seeks responsive, timely, and high-quality support to forward-stationed forces throughout the world, while reducing the Navy's total ownership costs. The focus areas of this strategy are: optimization through best-value acquisitions; customer support and communication; process innovation; and workforce productivity. The strategy has three overall objectives. The first is to ensure extraordinary support to the warfighter. The second is strategically to source infrastructure, maintenance,and service functions,as well as our supply inventory, where it makes both operational and business sense. The third and final objective is to optimize resource effectiveness and reduce redundancy within our remaining infrastructure.

Manpower and Personnel

The Navy's people—Active, Reserve and civilian—are the most essential part of our warfighting capability. Our capacity to provide sufficient operational forces, as well as shore support, to sustain a force structure with credible naval combat power is indespensable to meeting

the missions of the Navy. Among other things, we must address critical naval capabilities to support national strategic requirements for homeland security and defense, persistent presence in forward areas, deterrence, prompt and assured crisis response, and warfighting. The personnel system must provide for the acquisition, development, retention, and management of the civilian and military workforce, including programs for recruiting, quality of life, community management,and distribution of personnel.

Finally, we must take human factors into account in the design, engineering, integration, and operation of our weapon systems and platforms. This focus on human-factors engineering and human-systems integration has implications for recruiting, training, compensation, detailing, and development of our Sailors' careers. The fundamental principle that will continue to shape our approach is *Mission First… Sailors Always.* Moreover, our Sea Power 21 vision demands a highly educated, experienced and flexible force capable of sustaining our technical advantage to swiftly and convincingly defeat our enemies. *Sea Warrior* is the critical bridge to this future, which seeks to maximize human capital through transformed manpower processes. Sea Warrior reinforces the Navy's commitment to the growth and development of its most valuable resource, people, and ensures mission success by delivering the *right Sailors at the right time, to the right places, and in the right numbers and skill sets.*

Readiness

Sea Enterprise is changing the way the Navy does business—finding innovative and less costly methods while supporting the critical training, supply, and maintenance programs that are essential to readiness. This team evaluates these programs and reviews current indicators and trends to ensure that readiness is maintained. Included in the readiness area are Navy operating funds, force operations, flying hour/steaming day programs, all levels of maintenance, spares, ordnance and fuel, and safety and survivability.

Training and Education

Training and education capabilities are provided in four major functional categories: accessions; skills; professional development; and unit/force training. Programs include the staff, facilities, equipment, and services required to train. The objective of naval training and education programs is to deliver, efficiently and effectively, high-quality training and education that provides a career-long continuum supporting Navy operational readiness and personal excellence.

Naval Capabilities Development Process

The DCNO for Warfare Requirements and Programs (N6/N7) is the executive agent and lead for implementing the Naval Capabilities Development Process (NCDP), which in November 2002 superseded the Battle Force Capability Assessment and Programming Process (BFCAPP), put in place the year before. The Navy thus sharpened the focus on capability-driven warfighting requirements to enhance the ability to communicate a long-term warfighting vision that shapes research and development, procurement, force structure, and capabilities to counter threats and achieve mission success. The NCDP addresses requirements both within and beyond the current Future Years Defense Plan (FYDP) programming horizon. The process looks to establish an affordable long-range Naval Capability Plan (NCP) and an Integrated Sponsor's Program Proposal (ISPP) for warfare systems that will meet the operational needs of the Fleet and regional combatant commanders. The goal is to develop integrated, executable, and realistic sponsors' resource allocation proposals that deliver the greatest degree of balanced warfighting capability within available resources. If resources are insufficient to deliver warfighting wholeness, the process will quantify the remaining risk and determine the "above-core" priorities to mitigate it.

This new process established Warfare Sponsors within OPNAV who are responsible for developing Mission Capabilities Packages (MCPs) within the four naval capability "pillars"—Sea Strike, Sea Shield, Sea Basing, and FORCEnet—that cross and link platform-specific communities (e.g., Naval Aviation, Surface Warfare), and coordinating the MCPs with resource sponsors, fleet commanders, and the acquisition community. Each of the four naval capability pillars is supported by two or more MCPs, which serve as the primary mechanism to identify the current baselines of capabilities and to forecast capability evolution, thus contributing to comprehensive planning and programming for integrated systems capabilities identified in Navy and Joint-Service strategies.

Critical issues to be addressed include redundancy among systems, interoperability, reasonableness of cost and performance, and program schedule.

The four naval capability plans comprise all MCPs for each Naval Capability pillar and become the Navy's warfare investment strategy for programming operational capabilities. The Integrated Sponsor's Program Proposal, which merges the NCPs and resource-sponsor programming input, is approved by N6/N7 and presented to the DCNO for Resources, Warfare Requirements,and Assessments (N8) as a consolidated programming proposal that integrates all N6/N7 warfare areas within a specific Program Review or Program Objective Memorandum developed by N8.

Navy Program Implementation

Even as the Navy continues its transformation to the capabilities and forces needed for the future, we must balance the costs of modernization and recapitalization—future readiness—with maintaining today's current readiness for missions and tasks that may arise at any time. This requires balancing recapitalization and modernization of aircraft,ships, submarines,and infrastructure with funding today's operating forces and providing a high Quality of Service for our people and their families.

Based on previous experience, we know we must put in place the resources to attract, train, and retain the people we need for the future. That said, we must also ensure that our highly skilled and dedicated Sailors have the necessary tools for the complex and demanding jobs that lie ahead. The balancing of priorities and the requisite resource allocation decisions comprise the key portion of the Navy's PPBE process: programming and budgeting. The result is a program that allocates resources to meet the Navy's highest priorities at some level of risk as the critical needs are funded at the expense of lower-priority programs. These difficult decisions are based on intensive analysis,informed reviews, and critical projections constrained by the reality of limited resources.

Quality of Service

Manpower remains the Navy's number-one priority, and ensuring a high Quality of Service is an essential element of the Service's ability to attract and keep the best and brightest people. Quality of Service is a balanced combination of Quality of Life and Quality of Work programs, both of which are key contributors to meeting manpower goals.

Quality of Life

An important element of our Quality of Service approach are the Quality of Life programs comprised of numerous services that add to the well being of our people and are important factors in both overall readiness and retention.Quality of Life traditionally includes programs focusing on compensation, safety and health, medical care, military accommodations (both shore- and sea-based), recreation, Personnel Tempo (PERSTEMPO) limits in addition to legal, chaplain, community, and family services. These Quality of Life elements provide support for our families and enable Sailors to focus on their prime responsibility: mission accomplishment.

Quality of Work

We ask a lot of our Sailors. In return we owe them a high Quality of Work standard—proper tools, sufficient supplies, modern facilities,and a physical working environment equal to the importance of the mission and commensurate with those offered by competing careers. Their work must be centered on honing their professional skills and enhancing the mission effectiveness. A satisfying Quality of Work is one of the most important factors in retaining our best people. Efforts to enhance Quality of Work include:improved operational unit manning; Smart Work initiatives that capture new technologies and seek better ways to do business; Inter-Deployment Training Cycle workload reduction initiatives; career-long emphasis on professional development; and increasing workplace and shore facilities.

Both Quality of Life and Quality of Work are essential to the Navy's ability to attract and retain highly talented people. Job satisfaction, ongoing professional growth, high-quality training and education, personal recognition, confidence in our promises to them and their families—all comprise crucial elements of the Navy's Quality of Service. Sailors must draw personal and professional pride and satisfaction from what they do throughout their service to the nation. They must sense that what they do is important and worth their personal sacrifices. This is central to both current and future force readiness.

Force Readiness

Numbers matter; quantity has a quality all its own. While the capabilities of tomorrow's netted sensors and weapons will increase the potency of each ship and aircraft, numbers will always be of concern:a ship or an aircraft cannot be in two places at once. Moreover, insufficient ordnance, supplies, and equipment pose significant crisis-response and warfighting risks. All carrier strike groups (CSGs) that deployed during 2003 engaged in actual combat operations during their deployments, including seven carriers that supported coalition forces during Operation Iraqi Freedom—the successful outcomes being dependent upon having the right weapons and enough of them to do the job at hand. Even when combat does not occur, shortages greatly compound the work required of our Sailors, as older equipment is kept operating beyond its intended service life and shortages force the "cross-decking" of equipment, spares, supplies, and ordnance—and sometimes people,as well. At the end of 2002, for example,the USS *George Washington* (CVN-73) battle group had just returned from a six-month deployment only to be placed on 96-hour notice to redeploy, should that have been necessary to support operations against Saddam Hussein's regime.

Under normal, more routine situations, the Navy has continued to meet its commitments primarily by drawing upon the forward-deployed, in-theater "rotational" forces, rather than requiring additional deployments of units that have just returned from, or are beginning to work up for, deployments. We have been able to do this mainly by demanding more from our people and our equipment. But this cannot go on indefinitely. Indeed, while the 1997 Quadrennial Defense Review concluded, and the 2001 QDR confirmed,that the Navy must sustain a force of some 305 ships and 12 carrier battle groups (CVBGs)—down from the 1993 Bottom-Up Review requirement of 15 CVBGs and 14 carrier air wings, for a total of 346 ships—to satisfy the operational requirements of the Military Strategy, given resource limitations—current projections show that the Navy will have difficulty sustaining even such a downsized force without "topline" budget relief. (Figures 2-6 illustrate current projections for personnel and force structure, aircraft carriers, attack submarines, surface warships, and amphibious assault ships.)

As the Navy's senior leadership has testified, a force of about 300 ships is marginally sufficient—within an acceptable level of risk—to meet near-term forward-presence and crisis-response needs. However, mounting evidence suggests that our 300 ships—some

of which are not warships—will not be enough in the future. Moreover, unless older ships are retained beyond current programmed service lives and the acquisition of new warships is accelerated, geting to and sustaining even a 300-ship Fleet will be a difficult proposition. Recent force projections, based on the FY 2004 Program Objective Memorandum, indicate that the "QDR Navy" cannot be sustained without an increase in ship construction. Indeed, in the near term, the active forces will decline to some 290 ships. Unless rectified, this will bring into question the Navy's ability to carry all roles,missions, and tasks identified in the Defense Planning Guidance and support emerging strategies. More recently, the Chief of Naval Operations has cited a force-level objective of approximately 375 ships to satisfy "Sea Power 21" requirements.

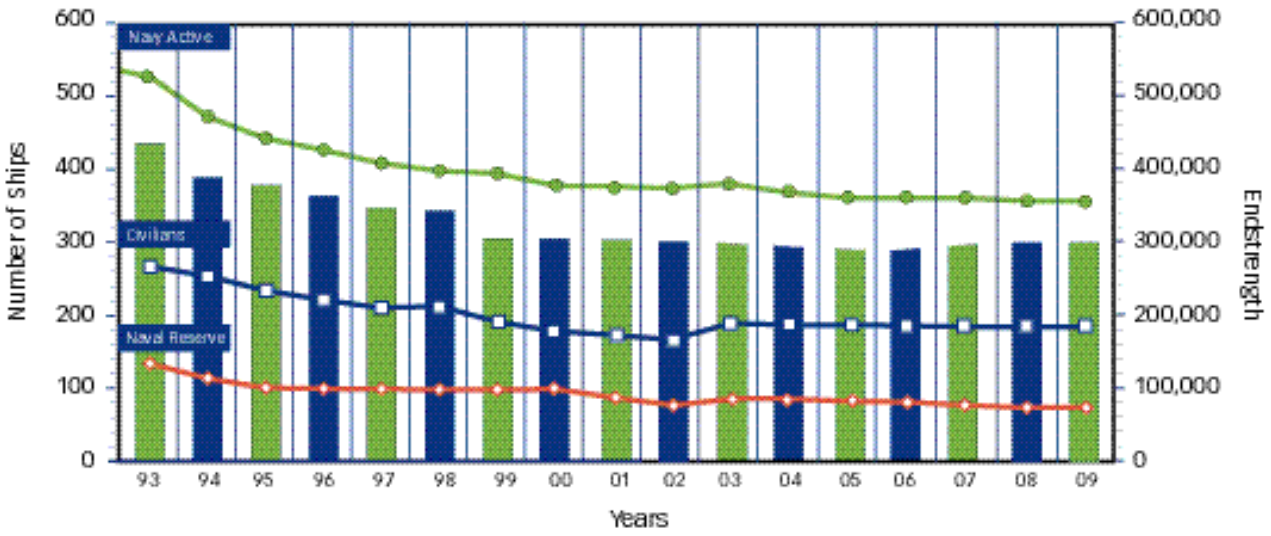


FIGURE 2 | U.S. Navy Force Structure and Endstrength

As an example of being spread too thin, carrier underway time during deployments has risen steadily from historical norms. In 1998-1999, as well as the fall 2001, the aircraft carrier homeported in Japan had to respond to unplanned deployments to the Arabian Gulf and Arabian Sea to cover our commitments there. We simply had no other recourse than to "surge" that carrier into a forward operating area at times in its operational cycle when critical maintenance still needed to be carried out. Likewise, at the start of Operation Allied Force in early spring 1999, the nation had no aircraft carrier battle group in the Mediterranean, which constrained the amount of pressure NATO could apply against Serbian forces,and the carrier had to be redeployed from another area of operations. And, in the immediate aftermath of the 11 September 2001 terrorist attacks on the U.S., the USS *Enterprise* (CVN-65) had begun to return home from a six-month deployment but remained in the region to support the initial strikes in Operation Enduring Freedom.

Similarly, we are growing critically short of certain "low-density/high-demand" (LD/HD) aircraft, particularly the EA-6B Prowler electronic-warfare (EW) aircraft. The demands of today's chronic-crisis and combat threat environment, in which even minor countries can have sophisticated air defenses,drive the need for effective electronic warfare and suppression of enemy air defenses. The decision to retire the Air Force EF-111A Raven EW aircraft and to assign all Department of Defense radar-jamming missions to the Prowler adds to the significance of the EA-6B in Joint warfare. With its jamming and High-Speed Anti-Radiation

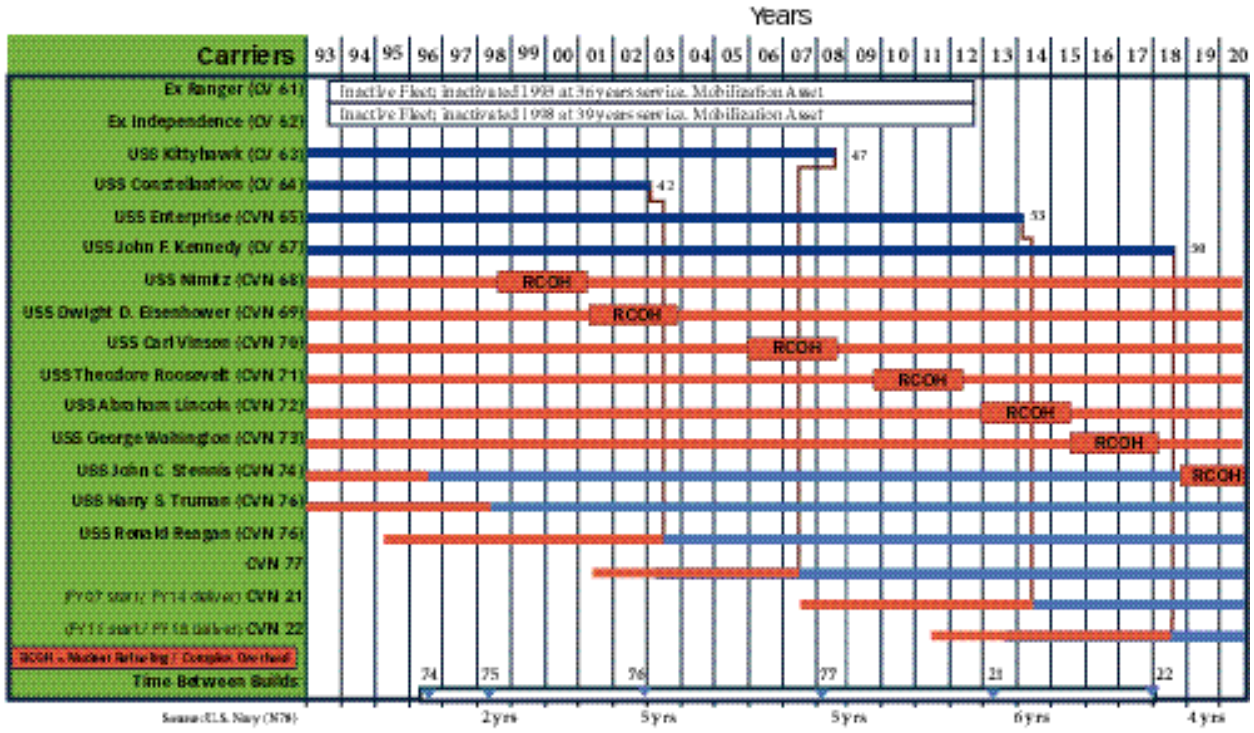


FIGURE 3 | Aircraft Carrier Build Schedule (Calendar Years)

Missile (HARM) capability, the Prowler provides capabilities to deny an adversary's use of radar and communications unmatched by any airborne platform worldwide. These capabilities were amply demonstrated during the 12-year enforcement of "no-fly" zones in Iraq and experiences in Operations Allied Force, Enduring Freedom, and Iraqi Freedom. Its proven effectiveness in combat underscored the Prowler's role as an indispensable element of coalition air operations. To meet future Airborne Electronic Attack (AEA) requirements, the EA-18G variant of the F/A-18 Hornet strike-fighter will replace the U.S. Navy carrier-based EA-6B force with an IOC of 2009.

Various studies following the 1997 QDR concluded that specified force structure for nuclear-powered attack submarines and surface warships will not be sufficient to meet the future operational requirements or to satisfy strategic guidance for future conflicts. In the 1999 nuclear-powered attack submarine (SSN) study, the Joint Chiefs of Staff (JCS) concluded that by 2012 the Navy would need as many as 68 modern SSNs, of which 18 should be *Virginia* (SSN-774)-class submarines. This is a significant increase from the 1997 QDR conclusion of 45-55 SSNs just to meet current operational commitments. Additionally, the JCS study concluded that any fewer than 55 SSNs in 2015 would leave the combatant commanders with insufficient capability to respond to time-critical, urgent demands. An attack submarine force-level study conducted in 2002 by the Navy identified 55 attack submarines as the minimum warfighting requirement to meet the 2001 QDR force-sizing construct. For this reason, the Navy is investigating proposals to refuel in-service *Los Angeles* (SSN-688) class submarines as well as to accelerate procurement of *Virginia* SSNs.

Our surface warship forces are likewise experiencing operational and personnel tempos rarely endured during the Cold War. The 2001 QDR acknowledged this and directed the four Armed Services in the Department of Defense to restore readiness and transform. To accomplish this, the Navy has recognized the need for a family of surface combatants bringing transformational capabilities to the service. This family of ships—centered on the

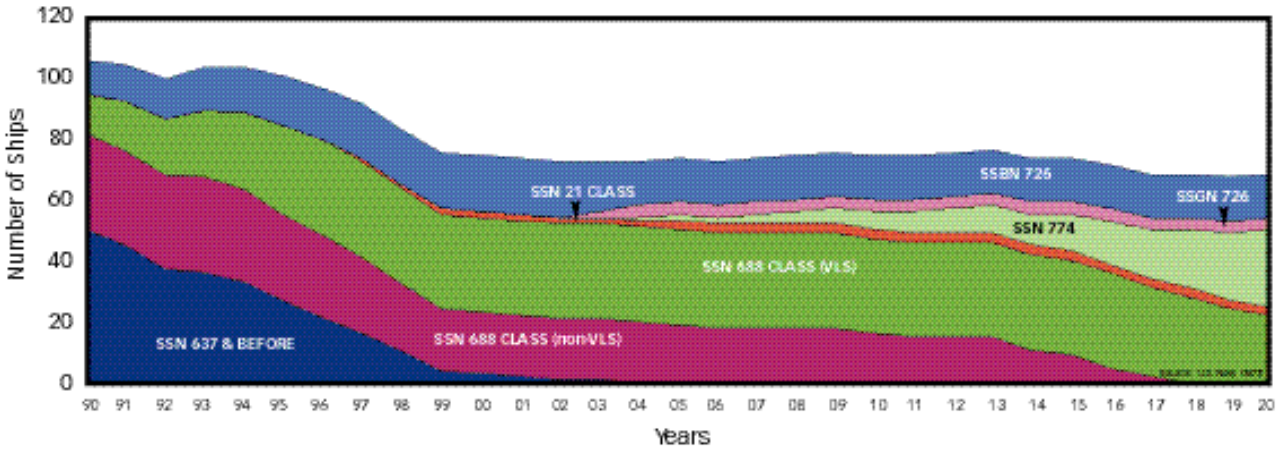


FIGURE 4 | Attack,Guided-Missile, and Ballistic Missile Submarines

next-generation multi-mission destroyer, DD(X), and including upgraded in-service Aegis warships, a next-generation cruiser, CG(X), and the Littoral Combat Ship (LCS)—will provide naval and Joint force commanders with a range of warfighting capabilities across the spectrum of warfare. From fighting and winning in the tough littoral environment with the LCS, to the theater-wide strategic reach of the CG(X), the Navy's future surface warships will be designed from their keels up to operate as critical elements of a forward-stationed,distributed, networked, joint force.

To help meet near- and mid-term needs,the Navy will upgrade the in-service Aegis cruisers and destroyers with selected leading-edge technologies,some of which are being developed during the DD(X), CG(X), and LCS design and production processes. This will ensure that this vital core of the multi-mission Fleet will maintain operational effectiveness throughout their lifetimes and until the DD(X) and CG(X) programs come to fruition. We will also maintain the force structure of our *Oliver Hazard Perry* (FFG-7)-class frigates by modernizing their hull,mechanical and electrical (HM&E) systems and conducting a limited combat-systems upgrade to improve their survivability in the littoral combat environment. Because of their high operational costs and limited room for combat system growth or modenization, the *Spruance* (DD-963)-class destroyers will be decommissioned during the next four years.

Our Combat Logistics Force was well represented in Operation Iraqi Freedom and provided outstanding service to the ships in the Mediterranean, Arabian Gulf,and Red Sea. To increase the peacetime availability of these ships, we are continuing the transition of the remaining Navy-manned *Supply* (AOE-6) fast combat support ships to the Military Sealift Command. The *Lewis and Clark* (T-AKE) stores/ammunition ship program is on track for replacing the aging T-AFS and T-AE store ships. As the *Sacramento* (AOE-1) fast combat support ships are nearing the ends of their

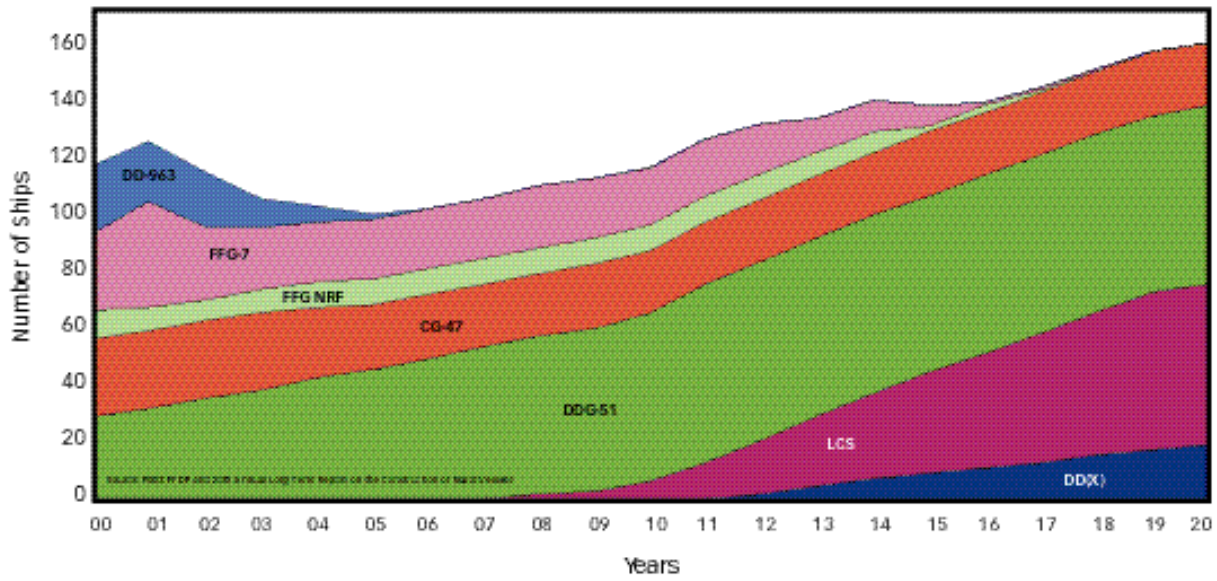


FIGURE 5 | Surface Warship Projections

service lives and will be decommissioned in the next two years, we have programmed the T-AOE (X) as their replacement and will field it as soon as fiscal realities permit.

The requirement for our amphibious warfare forces includes the capability to lift the assault echelon of 3.0 Marine Expeditionary Brigade (MEB) equivalents. This 3.0 MEB equivalent is the troops, aircraft, vehicles, equipment and cargo of a Marine Expeditionary Force (MEF), which is the primary Marine Air Ground Task Force (MAGTF) that is task-organized to fight and win in conflicts ranging from smaller contingencies to regional war. Currently, lift is available for only 12 Amphibious Ready Groups, or 2.5 MEB equivalents. However, fiscal constraints have limited our assault lift capacity to less than the established 2.5 MEB goal; we are today a 2.1 MEB lift force.

We must,therefore, continue to focus on the transformation of our amphibious warfare shipping-large-deck/aviation-capable amphibious assault ships, dock landing ships, landing platform dock ships-to a force that can affordably meet future needs. Critical elements of our plan include the acquisition of *San Antonio* (LPD-17)-class amphibious platform docks, the total number to be acquired is under review; the design, engineering, and acquisition of the next-generation amphibious assault ship (LHA-R); and modernization of in-service ships. If we become frustrated in our goal for the LPD-17 program, our lift capability will atrophy to less than the current 2.1 MEB equivalents by the end of the decade.

Since mission accomplishment is our top priority, our focus on readiness is correct. The Fleet Response Plan (FRP), developed last year under the guidance of CFFC, is designed to better support the National Security Strategy with persistent naval capabilities that are both rotational and surgeable. The FRP accelerates the Navy's advantage in responding whenever the commander-in-chief needs our naval forces and harnesses the Navy's enhanced speed and agility to ensure we arrive with overpowering force whenever needed.

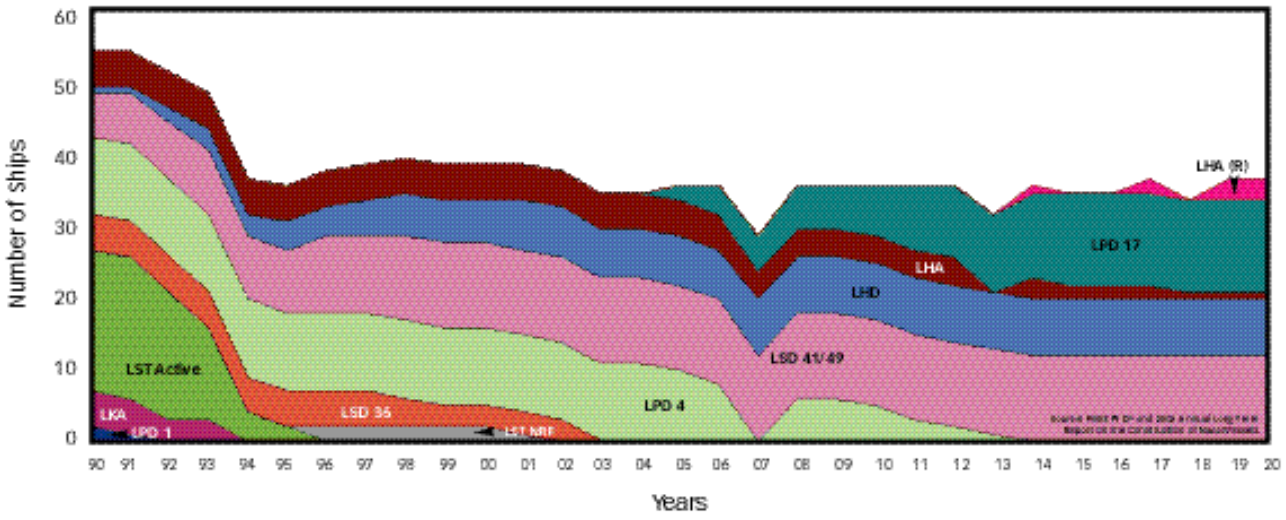


FIGURE 6 | Amphibious Ship Projections

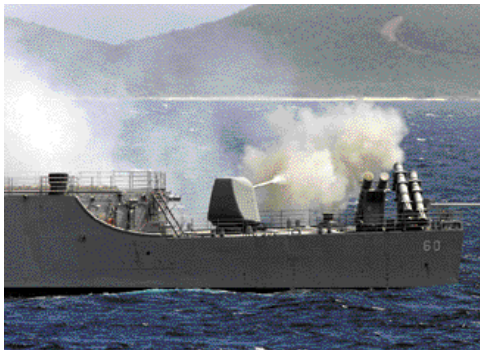
Current Readiness

One-third of our Fleet is deployed on average every day, and we are focusing on ways to ensure that deployed readiness remains high. We know too that non-deployed readiness bears the brunt of supporting our forward-deployed presence. Although we have seen some improvement during the last four years in reducing shortfalls, the limited availability of support material for our non-deployed units continues to be a significant readiness challenge. While we have made a significant funding commitment in FY 2004, sufficient resources must be sustained to ensure non-deployed readiness is assured.

In some areas, we are showing slight improvement,particularly in CSG manning and Naval Aviation. With regard to the latter, we are continually reviewing the flying hour program to ensure our funding reflects the increasing operational costs associated with our aging aircraft. The Navy's aviation force is now the oldest it has ever been in its history—an average age of nearly 19 years. And, we expect that the average age will increase by 0.5 years per year, at programmed procurement rates.Our cost models do not accurately predict the true cost of operating our aviation assets. The same holds true for aircraft depot maintenance, which ensures that engine and airframe maintenance is sufficient to meet fleet requirements for available aircraft and spare engines. We are also seeing some improvement in the reduction of aircraft bare firewalls, aircraft cannibalizations, the size of our maintenance backlogs, and the percent of aircraft available. That said,it will take continued emphasis across the full spectrum of readiness areas, together with the necessary funding, to continue the recovery. Until we have achieved a modernized force, we will continue to face the challenge of the increasing costs to maintain the legacy, aging and increasingly obsolescent force.

Shortfalls in maintenance, spare parts and support equipment have affected our training readiness among all Navy non-deployed forces. Surface ships, submarines and aircraft squadrons in the earlier stages of the Interdeployment Readiness Cycle are confronted with the reality of having to train with fewer resources, because units in the latter stages of the process have priority to ensure combat ready status.

Likewise, there is growing concern about the Navy's inventories of precision-guided munitions (PGMs), including the Joint Stand-Off Weapon (JSOW), Joint Direct-Attack Munition (JDAM), and the Tomahawk land-attack cruise missile (TLAM). Although the Congress has helped to address this challenge, specifically responding to the high expenditure rates of PGMs that have occurred as a result of recent contingency operations, we are still below the current warfighting requirement. The PGM shortfall is a major risk-driver for our forces in our ability to defeat decisively one of two adversaries, to include invading and occupying enemy territory, and decisively imposing our will on any one aggressor of our choosing—the "2" and "1" elements of the "Defense Guidance."



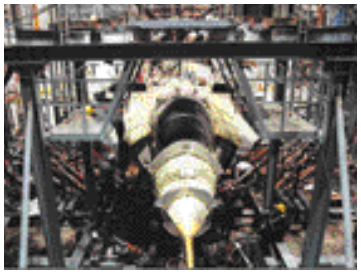
The Navy is also faced with several external factors that are impeding our ability to test, train and operate safely and effectively. Continued military readiness depends on reliable access to all necessary training, testing, and operational exercise areas.Our military training ranges are national assets that allow our forces to train in a controlled, realistic, and safe environment. Urban encroachment, the obligations of environmental compliance on land and at sea, and concerns about noise and airspace congestion require a comprehensive approach to sustain access. Untrained or under-trained people cannot perform well in combat and present an increasing risk during peace. The Navy has

initiated a comprehensive training range and operating area sustainment program to ensure continued access to ranges and operating areas. A Navy Range Office has been established within N4 to oversee this important effort.

The use of live ordnance, for example,is a vital means of training our forces in combined arms operations. The inability to conduct coordinated live-fire exercises from ships and strike aircraft is particularly detrimental to readiness, given that almost routinely carrier battle groups continue to engage in combat operations soon after arrival in theater. Our ability to train jointly, especially with the Marine Corps, is being affected by the uncertainty of live-fire, combined-arms training for Atlantic Fleet Forces. The growing lack of realistic training increases the risk to our Sailors and Marines, and their missions. Our forces should get their first experience with live arms before they engage in actual combat, a goal implicit in our philosophy of train as you fight.

The Fleet has gotten smaller, and the number of ships we routinely deploy with each battle group has decreased. During the downsizing of the 1990s, from the "600-Ship," 15-CVBG,14-carrier air wing force during the 1980s to the approximately 315 warships, 12 battle groups, ten air wings, and 12 amphibious ready groups at the turn of the century, the demand for deployed naval forces has increased. Because our carrier strike groups and expeditionary strike groups routinely deploy with fewer surface combatants than ten years ago, theater commanders have fewer assets to cover commitments, and must time-share assets among theater commanders, often leaving gaps in coverage at times when we can least afford them. Fewer assets mean more underway time per unit. Increased operational tempo results in additional wear and tear on our most valuable resource, our people and their families, not to mention the Navy's ships, aircraft and equipment. The end result is that our ships require more maintenance, which increasingly has had to be deferred because of insufficient resources. It is vitally important that we begin to fund 100 percent of our manning, maintenance, ordnance, modernization, recapitalization, and training requirements. Mission success and lives are at stake.

The growing number of carrier battle group "gaps" in operational coverage has led to internal assessments of the need for highly flexible and effective Carrier Strike Groups, Expeditionary Strike Groups, and Expeditionary Strike Forces to satisfy the requirements of the nation's security and military strategies. Coupled with independent operations by missile defense surface action groups (SAGs) and nuclear-powered guided missile/special operations submarines (SSGNs), the future Fleet of approximately 375 ships will dramatically increase the operational flexibility, global reach, and striking power from today's approximately 19 independent strike groups (12 CVBGs and seven Middle-East Force surface action groups) to 37 independent strike groups. Under the new Fleet Response Plan, these 37 strike groups will include 12 Carrier Strike Groups, 12 Expeditionary Strike Groups, nine Strike/Missile Defense SAGs, and four SSGN Strike/SOF forces. The bottom line is that in this way Navy "presence with a purpose," operational flexibility under the Fleet Response Plan, and warfighting effectiveness will be optimized in support of the "1-4-2-1"strategic guidance.



Future Readiness

Although sustaining current operational readiness is a top priority, maintaining aging equipment and infrastructure and modernizing our forces are growing concerns. The need to pay for current readiness first must be balanced with the imperatives to improve and ultimately replace the equipment we have in the Fleet today. Modernization enables our current forces to continue to be valuable warfighting assets in the years ahead while concurrently trying to mitigate escalating support costs of aging equipment. Also, as technological cycle times are now shorter than platform service life, it is fiscally prudent to modernize the force through timely upgrades, and, when it makes good operational and business sense to do so, to incorporate commercial open-source technologies and systems.

Adequate readiness can only be sustained in the future with modernization and recapitalization programs that deliver adequate numbers of technologically superior platforms and systems to the Fleet. This has become a challenging task. The Fleet is aging and there is real and growing tension between maintaining near-term readiness while supporting future modernization and recapitalization. We are pursuing initiatives that will lower our cost of doing business so we can maintain near-term readiness and still invest more in the future.

Sustained future naval readiness begins with a recapitalization program that delivers the right number of technologically superior platforms and systems for the Fleet. We therefore need to invest with a focused and expanded program to maintain naval superiority well into the first half of the 21st century. Current Department of Defense plans require an 8-10 ship and 180-210

	FY04	FY05	FY06	FY07	FY08	FY09
F-35 Joint Strike Fighter	0	0	0	2	16	40
F/A-18E/F Super Hornet	42	42	38	30	24	20
EA-18G Hornet	0	0	4	12	18	22
E-2C Hawkeye	2	2	2	2	0	4
MH-60R Seahawk	4	8	15	21	31	31
MH-60S Seahawk	13	15	26	30	30	40
Maritime Multi-Mission Aircraft	0	0	0	0	0	8
Aerial Common Sensor	0	0	0	0	0	2
KC-130J Hercules	0	4	4	4	4	5
MV-22 Osprey	9	8	15	29	30	33
VXX Executive Transport Helicopter	0	0	0	0	4	0
UH-1Y/AH-1Z Super Cobra/Huey	9	9	12	19	21	21
CH-53E	0	0	0	0	3	5
T-45 Goshawk	14	8	5	0	0	0
T-6A Texan II JPATS	0	0	0	24	48	48
T-48 Training Aircraft	0	1	3	3	7	0
C-40 Clipper	1	1	3	3	0	0
UC-35 Operational Support Aircraft	4	0	0	0	0	0
C-37 VP-3A Replacement	1	1	0	0	0	2
Broad Area Maritime Surveillance UAV	0	0	0	2	4	4
Total	99	99	127	181	240	285

FIGURE 7 | FY 2005 - 2009 Aircraft Procurement Plan

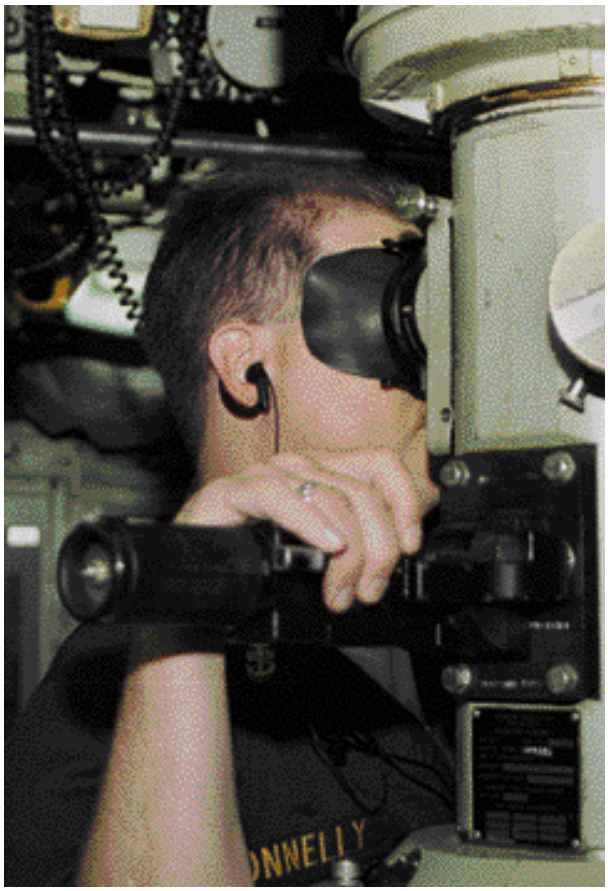
aircraft per year build rate to sustain the 1997/2001 QDR force. The actual number of ships,aircraft, ordnance,and spare parts in our plan is not sufficient to meet this need; and will not provide the assets necessary to carry out critical missions and tasks under current "Sea Power 21" guidance, which requires a Fleet of approximately 375 ships and procurement of 11 ships per year. This is an ambitious goal, one that we cannot achieve unless we are a smarter and more efficient consumer of resources.(Figures 7 and 8 lay out the current acquisition plan for ships and aircraft.)

That said, the current shipbuilding and modernization plan and aircraft acquisition and modernization programs do not deal adequately with the "bow wave" of investments that we anticipate will be needed to meet even mid-term future commitments and requirements, much less those beyond the FYDP. While the specific numbers, types, and mix of ships and aircraft will—and should—be debated,several years of high-tempo operations and analysis point to the need for more ships and aircraft than we currently have. Many existing ships require modernization in combat systems as well as hull,mechanical and electrical systems. The steady erosion of the service lives of our platforms and equipment and lack of a viable recovery plan will eventually lead to a point where the Navy will be unable to sustain operational commitments. In short, numbers matter; quantity has a quality all its own. For this reason, the CNO has called for a program to reach and sustain a Navy of approximately 375 ships.

Moreover, in addition to seeking additional research and development and acquisition funding, the Navy has reinvigorated an aggressive effort to reinvent its shore establishment to free-up funds for future readiness and modernization of the operating forces. There are three primary components of this effort: the reduction of infrastructure costs and consolidation of redundant services and functions;the establishment of Navy-wide standards and metrics for all shore installation functions; and the identification and implementation of best business practices, particularly under the Sea Enterprise initiative.

	FY04	FY05	FY06	FY07	FY08	FY09
CVN-21 Next-Generation Aircraft Carrier	0	0	0	1	0	0
SSN-774 *Virginia* Class	1	1	1	1	1	2
DDG-51 *Arleigh Burke* Class	3	3	0	0	0	0
DD(X) Next-Generation Destroyer	0	1	0	2	2	3
LPD-17 *San Antonio* Class	1	1	1	1	1	1
LHD/LHA(R) Amphibious Assault Ship	0	0	0	0	1	0
LCS Littoral Combat Ship	0	1	2	1	3	6
T-AOE(X) Next-Generation Combat Support Ship	0	0	0	0	0	2
T-AKE Lewis and Clark Cargo/Ammunition Ship	2	2	2	1	0	0
Maritime Prepo Ship/Aviation Variant	0	0	0	0	0	1
Maritime Prepo Ship/Joint Command Ship Combo	0	0	0	1	0	2
Total	7	9	6	8	8	17

FIGURE 8 | FY 2005 - 2009 Shipbuilding Plan



Investing Today for Tomorrow's Challenges

The "CNO Guidance for 2004" makes clear that "Sea Power 21" is the service's vision to deliver enhanced capabilities through new concepts, technologies,organizational initiatives, and improved acquisition processes. The objective now is to accelerate our advantages. This requires dedication to a process of continual innovation and commitment to total joint ness. Among the critical challenges we face is finding and allocating resources to recapitalize the Fleet.

The allocation of resources for today's and tomorrow's naval forces is like buying an insurance policy. We do not need to know precisely how or where we will use these forces in order to see their value—indeed, our value is greater because we are useful virtually anywhere. Our mobility, adaptability, variable visibility, and cooperative and independent capabilities combine with our knowledge of the battlespace and immense firepower to make us an especially usable and useful force for assuring U.S. security, at home and abroad. Thus, despite the challenges facing us today, we are convinced that ready and modern naval forces will remain vital to the nation's security—an insurance policy against threats and challenges to U.S. interests, citizens, and friends. The balancing of present needs and future imperatives within available resources will always be a complex endeavor.

Chapter Three provides summaries of the Navy's programs for our people, our sensor and weapon systems,and our ships,aircraft, and submarines—the foundation for tomorrow's Fleet. Balanced against competing priorities within available resources, these programs set our course for the future, to ensure that the vision of "Sea Power 21" indeed will be realized.

CHAPTER 3

REQUIREMENTS TO CAPABILITIES

The U.S. Naval Services—the Navy and Marine Corps Team and their Reserve components—possess three characteristics that differentiate us from America's other military services and make us a uniquely powerful instrument of national policy and will. First, we operate from the sea, with all of the opportunities for strategic maneuver, operational flexibility, and tactical agility that the sea provides. Second,we are expeditionary—when our ships, aircraft, Sailors, and Marines deploy around the globe, they carry with them what they need to accomplish the mission at hand—with or without host-nation support. Third, in an age of inter-service and coalition interoperability, the Navy and Marine Corps are linked much more closely than the other armed services—Army, Air Force, and Coast Guard—in strategy, doctrine, tactics, training, and operations. All come together to ensure the Navy's ability to carry out Sea Strike, Sea Shield, and Sea Base operations. As the Secretary of the Navy's "Naval Power 21… A Naval Vision" states, "In a world of violent horizons, the Navy-Marine Corps Team will serve America: anywhere, anytime."

Department of Defense Acquisition

The Under Secretary of Defense for Acquisition, Technology, and Logistics—USD(AT&L)—has established a defense acquisition policy directing the service secretaries and Defense Department component heads to execute a single, standardized, Defense Department-wide acquisition system. Program costs principally determine Acquisition Categories (ACAT I and II), with ACAT I having the most significant resource needs. In Fall 2000, Department of Defense acquisition instructions were changed to take into account a new, evolutionary and more flexible approach to acquisition. As illustrated in Figure 9, the new DoD 5000 acquisition model has five development phases, vice four in the old model. This is to allow a faster and better tailored start to new programs. Candidate initiatives can begin as formal new programs having already bypassed one or more of these new phases, based principally on degrees of technological maturity and risk.

In October 2002, the Deputy Secretary of Defense cancelled the Department of Defense system acquisition directives and instructions and replaced them with policy to create an acquisition environment that fosters efficiency, flexibility, creativity, and innovation. This streamlined process replaces the more prescriptive procedures of the prior Defense Acquisition System Directive (DoDD 5000.1) and the instruction for the Operation of the Defense Acquisition System (DoDI 5000.2). This action also cancelled DoD 5000.2-R, replacing it with

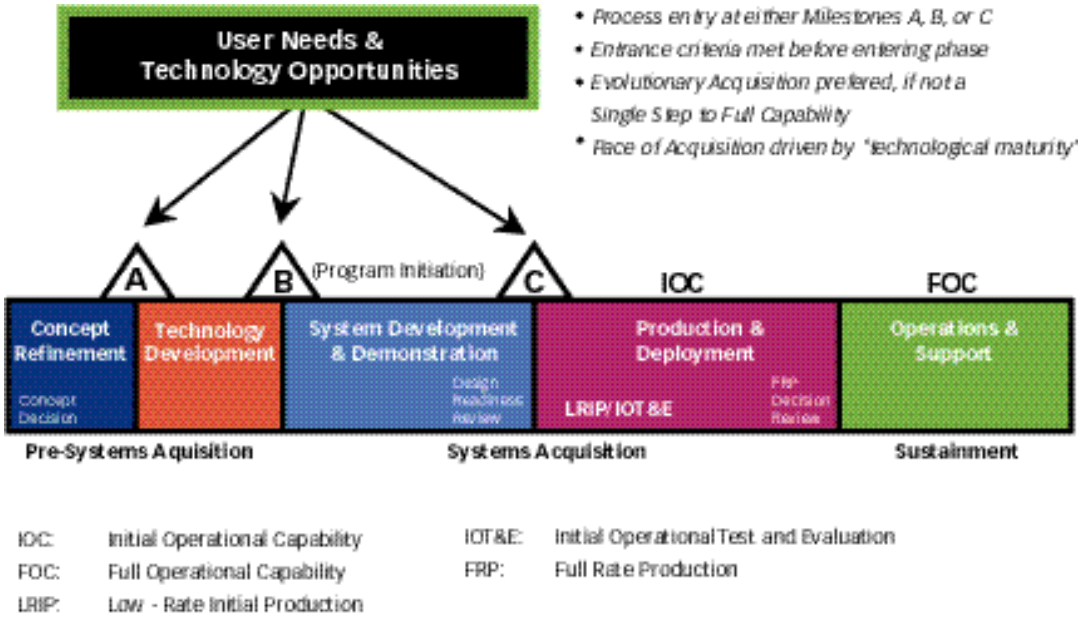


FIGURE 9 | DoDI 5000.2,The New DoD 5000 Model

a guidebook. The new policy and procedures promote evolutionary acquisition, give precedence to performance-based acquisition and logistics strategies,and emphasize rapid delivery of affordable and sustainable warfighting capability. The new policy and guidebook serve to:

- Define two development processes to implement the evolutionary acquisition strategy: Incremental Development in which the end-state requirement is known and the requirement will be met over time in several increments; and Spiral Development in which the desired capability is identified, but end-state requirements are not known at Program Initiation. Requirements for future increments are dependent upon technology maturation and user feedback from initial increments.
- Create an initiative to develop joint integrated architectures based on operational,system,and technical views. The operational view describes the joint capabilities that the user seeks and how to employ them; the systems view characterizes the available technology and system functionality, and identifies the kinds of systems and integration needed to achieve the desired operational capability; the technical view consists of standards that define and clarify individual systems' technical and integration requirements. Integrated architectures provide the construct for analysis to optimize competing demands.
- Rename and split the Concept and Technology Development Phase as Concept Exploration and Technology Development.
- Replace the Interim Progress Review with the Design Readiness Review.
- Provide for "special interest" as a determination for program ACAT I designation. Special interest includes those programs that have significant technology complexity; congressional interest; resource implications; are critical to achievement of a capability or set of capabilities; or are joint programs. ACAT I program designation is determined by program cost estimated by the USD(AT&L) to require eventual total RDT&E expenditure in FY 2000 constant dollars of more than $365 million, or procurement of more than $2.19 billion, or by identification as a "Special Interest" item by designation of USD(AT&L).
- Incorporate "materiel"in the analysis of doctrine, organization, training, materiel, leadership, personnel, and facilities (DOTMLPF) factors from "Joint Vision 2020."
- Reinforce the necessity to design and operationally sustain weapon systems in synchronization with applicable environmental requirements.
- Reflect Joint Chiefs of Staff policy (CJCSI 3170 series) to replace the Mission Need Statement (MNS) and Operational Requirements Document (ORD) with new documents under the Joint Capabilities Integration and

Development System (JCIDS). These documents are called the Initial Capabilities Document (ICD), Capabilities Development Document (CDD), and the Capabilities Production Document (CPD). The ICD replaces the MNS at Milestone A. The ICD captures capability shortfalls in terms of broad, time-phased operational goals, and describes requisite capabilities. The common element is capabilities that may be required to resolve a shortfall in warfighting capability and accommodate technology breakthroughs or intelligence discoveries. The ICD is to include an analysis of capability solution sets. Capabilities are to be conceived and developed in an integrated joint warfighting context. The CDD replaces the ORD at Milestone B, supporting subsequent program initiation and refining the integrated architecture. Each CDD will have a set of validated key performance parameters (KPPs) that will apply only to that increment of the evolutionary acquisition strategy. The CPD (updated CDD) replaces the ORD at Milestone C. The common element is a focus on capabilities that may be required to resolve a shortfall in warfighting capability or to accommodate technology breakthroughs or intelligence discoveries.

- Create an Information Technology Acquisition Board (ITAB) to replace the Defense Acquisition Board for review of major automated information system (ACAT IAM) programs.

The descriptive summaries of the programs addressed throughout Chapter 3 will refer to the current acquisition phase each program is in and/or the last milestone passed, as follows.

Concept and Technology Development (Milestone A) is the pre-systems acquisition phase during which initial concepts are refined and technical risk is reduced. Two major efforts that may be undertaken in this phase are Concept Exploration or Technology Development. Concept Exploration typically consists of short-term concept studies to refine and evaluate alternative solutions to the initial concept and provide a basis for assessing the relative merits of these alternatives. Technology Development is an iterative discovery and development process designed to assess the viability of technologies while simultaneously refining user requirements.

Systems Development and Demonstration (Milestone B) is the phase in which a system is developed. Work in this phase includes reduction of integration and manufacturing risk, while ensuring operational supportability, human systems integration, and producibility design. Demonstration of system integration, interoperability, and utility completes this phase.

Production and Deployment (Milestone C) is the phase in which Operational Test and Evaluations (OT&E) are conducted to determine system effectiveness, suitability, and survivability. The Milestone Decision authority may make a decision to commit to production at Milestone C, either through Low-Rate Initial Production (LRIP) for major defense acquisition programs or through Full Production (FP) or procurement for non-major systems.

Navy Department Acquisition

The readiness and warfighting requirements that shape the Navy-Marine Corps Team's acquisition and investment strategies originate with the operating forces and their operational representatives (e.g. OPNAV). The life-cycle execution of these requirements—to develop, acquire, support and maintain—is the principal responsibility of the Navy's acquisition chain of command, which includes the listed Systems Commands, Direct-Reporting Program Managers (DRPMs), and Program Executive Officers (PEOs).

As the stewards of the Navy's acquisition and total ownership/life-cycle support processes, Systems Commands, DRPMs, and PEOs are responsible for furnishing effective and efficient systems, platforms, training, and support in an environment of rapidly evolving requirements and fiscally constrained resources. Successful incorporation of these factors will be a key element in keeping America's naval expeditionary forces capable and ready to meet all challenges of the 21st Century. Acquisition initiatives at the Systems Command level have included the Naval Aviation Enterprise (NAE), a partnership between CNAF, N78 and NAVAIR that links material providers more clearly with requirements. This closer alignment directly supports the goals of the CNO's Sea Enterprise initiative.

As a complement to this core Requirements/Acquisition/Support function, Sea Enterprise provides an additional focus for investment rationalization. This initiative is being led by the Vice CNO and directly involves the Navy Headquarters, the Systems Commands, and the Fleet. Sea Enterprise goals are to increase organizational alignment, refine requirements, and reinvest savings to buy the platforms and systems that will transform the Navy. Sea Enterprise will decrease manpower costs by exploiting technological advances or human systems integration intiatives.

The remainder of this chapter provides program summaries of important elements of the Navy's investments to meet national needs and to continue its transformation for the future.The major program summary sections are as follows to the right.:

U.S. Navy Systems Commands, Direct-Reporting Program Managers,and Program Executive Officers – FEBRUARY 2004

Naval Air Systems Command
Naval Facilities Engineering Command
Naval Sea Systems Command
Naval Supply Systems Command
Space and Naval Warfare Systems Command
PEO Air Anti-Submarine Warfare, Assault, and Special Mission Programs
PEO Aircraft Carriers
PEO C4I and Space
PEO Information Technology
PEO Integrated Warfare Systems
PEO Joint Strike Fighter
PEO Littoral and Mine Warfare
PEO Strike Weapons and Unmanned Aviation
PEO Ships
PEO Submarines
PEO Tactical Aircraft Programs
Director, Navy-Marine Corps Intranet
DRPM Advanced Amphibious Assault Vehicle
DRPM Strategic Systems Programs

Sea Strike

Platforms

Aircraft

AH-1Z Super Cobra and UH-1Y Huey Upgrade

Description: The AH-1 Super Cobra is a two-place, twin-engine attack helicopter capable of land- and sea-based operations. It provides rotary-wing close air support (CAS), anti-armor/anti-helicopter, transport, helicopter escort, armed and visual reconnaissance, control of supporting arms, and shipboard and austere base operations, during day/night and adverse weather conditions. The UH-1 Huey is a twin-engine combat utility helicopter also capable of land- and seabased operations. It provides airborne command and control, combat assault support, control of supporting arms, medical evacuation, special operations support,search and rescue augmentation, visual reconnaissance,and shipboard and austere base operations, during day/night and adverse weather conditions.

The H-1 upgrade program involves conversion of both the AH-1W and UH-1N from a two-bladed rotor system to a four-bladed system, and re-designation to AH-1Z and UH-1Y, respectively (formerly referred to as "4BW" and "4BN," respectively). The upgrade program is designed to resolve existing safety issues in both aircraft, zero airframe time, reduce life-cycle costs, significantly enhance combat capability, and achieve 85 percent commonality between aircraft. Major modifications include a new rotor system with semi-automatic blade fold,new composite main and four-bladed tail rotor, upgraded drive system and landing gear, and pylon structural modifications. These aircraft will have increased maneuverability, speed and range, and payload capability. Additionally, both aircraft will incorporate a newly designed,fully integrated, common cockpit that will reduce operator workload and improve situational awareness.

Program Status: The Preliminary Design Review was approved in June 1997, and the Critical Design Review was completed in September 1998. LRIP began in the first quarter FY 2004, and Milestone III is slated for the fourth quarter FY 2005. Five EMD (Engineering and Manufacturing Design) aircraft have been produced, four of which will eventually become fleet assets and one aircraft (without an integrated avionics suite) will be used for Live-Fire Test and Evaluation. The program objective calls for a total of 280 airframes to be converted; 180 AH-1Ws to AH-1Zs and 100 UH-1Ns to UH-1Ys, with the last 12 AH-1Zs delivered in FY 2015.

Developer/Manufacturer: Bell Helicopter Textron, Inc., Common components production: Fort Worth, Texas; Assembly: Amarillo, Texas.

AV-8B
Harrier II+

Description: The AV-8B Harrier II is a single-seat, light attack aircraft that provides offensive air support to the Marine Air-Ground Task Force (MAGTF). By virtue of its Vertical/Short Take-Off and Landing (V/STOL) capability, the AV-8B can operate from a variety of amphibious ships, rapidly constructed expeditionary airfields, forward sites (e.g., roads), and damaged conventional airfields. This makes the aircraft particularly well suited for providing dedicated air support to the MAGTF or joint operations in any climate or location.

Two variants of the aircraft are in service operationally: the Night Attack and the Radar/Night Attack Harrier. The Night Attack Harrier improved upon the original AV-8B design through incorporation of a Navigation, Forward-Looking InfraRed (NAVFLIR) sensor, a moving map, night vision goggle compatibility, and a higher performance engine. The current Radar/Night Attack Harrier, or Harrier II+, has all the improvements of the Night Attack aircraft plus the AN/APG-65 multi-mode radar. The fusion of night and radar capabilities allows the Harrier to be responsive to the MAGTF's needs for expeditionary, night and adverse weather offensive air support.

The recently completed remanufacture program that rebuilt 74 older Harrier Day Attack aircraft to the Radar/Night Attack standard, extended the service life of these aircraft by 20 years and greatly improved their warfighting capability. The entire Harrier fleet is also being upgraded through the use of COTS technology. The Open Systems-Core Avionics Requirements (OSCAR) program will replace the existing Harrier mission and weapon computers with a COTS system that is affordable and easily upgraded and maintained. The introduction of OSCAR will include the capability to employ the Joint Direct Attack Munition (JDAM). Additionally, 76 Litening targeting pods have been acquired, which are used to provide laser and IR target acquisition/designation, further enhancing the AV-8B's precision targeting capability.

Program Status: Delivery of the final remanufactured AV-8B was made in September 2003. The AV-8B is scheduled to remain in service until the STOVL JSF replaces it. In order to remain responsive to transformational concepts and joint warfighting capabilities in support of National Security Strategies and the Global War on Terrorism, two current programs (OSCAR and Litening) are currently addressing critical modernization and warfighting enhancements. The OSCAR program is in its OPEVAL phase with IOC scheduled for March 2005. The precision targeting program, due to strong congressional support, has acquired the Litening targeting pods that have been forward deployed for use in both Operations Enduring Freedom and Iraqi Freedom. The last 20 pods were delivered in the Advanced Targeting (AT) configuration, which will provide enhanced acquisition and targeting capabilities, with the program intent of retrofitting all of the pods with AT technology before FY 2005.

Developer/Manufacturer: Boeing, St. Louis, Missouri.

CH-53X
Heavy Lift Helicopter

Description: The CH-53X is the planned follow on to the Marine Corps CH-53E Heavy Lift Helicopter. Major systems improvements of the newly manufactured helicopter will include larger and more capable engines, expanded gross weight airframe,drive train, advanced composite rotor blades, modern interoperable cockpit, external and internal cargo handling systems, and survivability. The CH-53X will be capable of externally lifting 27,000 pounds on a "Sea Level Hot" day (103° Fahrenheit) to a range of 110 nautical miles and dropping this cargo off in a landing zone at a pressure altitude of 3,000 feet at 91.5 degrees Fahrenheit, a capability more than double the current CH-53E under the same conditions. Additionally, it will be capable of carrying 32 combat loaded troops with the ability to surge to 48 troops. The CH-53X supports the Joint Operations Concept of Full Spectrum Dominance. The CH-53X supports Sea Power 21 by enabling rapid, decisive operations and the early termination of conflict by projecting and sustaining forces to distant anti-access, area-denial environments globally. Expeditionary Maneuver Warfare (EMW) establishes the basis for the organization, deployment, and employment of the Marine Corps to conduct maneuver warfare and provides the doctrine to make joint and multinational operations possible. EMW operational concepts include Operational Maneuver From the Sea (OMFTS), Forcible Entry Operations, Sustained Operations Ashore (SOA), and Other Expeditionary Operations (OEO). Under these supporting concepts, there is a continuing need for a heavy-lift capability to support sea-based expeditionary operations. The current Marine Corps heavy-lift aircraft, the CH-53E, designed in the 1960s and introduced in 1980 as an engineering change proposal to the CH-53D, has subsequently developed significant fatigue life, interoperability, maintenance supportability, and performance degradation concerns. In order to support the MAGTF and the JTF in the 21st-Century joint environment, an improved CH-53 is needed to maintain the Marine Corps' heavy-lift capability through the year 2025 and beyond. This aircraft must provide improvements in operational capability, interoperability, reliability, and maintainability while reducing total ownership costs.

Program Status: The CH-53X is currently Pre-Milestone B and undergoing risk reduction activities. The Marine Requirements Oversight Council concurred with the CH-53X ORD, and Milestone B KPPs on 28 October 2003. Milestone B is scheduled for Fall 2004. IOC is planned for FY 2012-2013 timeframe. Once in Full Rate Production, the aircraft procurement rate will ramp-up to approximately 24 aircraft per year by FY 2015. The Marine Corps requirement is currently 154 aircraft.

Developer/Manufacturer: Sikorsky Aircraft Corporation, Stratford, Connecticut.

E-6B Mercury
Airborne Command Post/TACAMO Aircraft

Description: The E-6B supports the Strategic Deterrence portion of the Navy's Sea Strike capability. The E-6B platform, derived from the Boeing 707, provides the Commander, U.S. Strategic Command with the command, control, and communications capability needed for execution and direction of strategic forces. Designed to support a robust and flexible nuclear deterrent posture well into the 21st Century, the E-6B performs VLF emergency communications, the Strategic Command Airborne Command Post mission, and Airborne Launch Control of ground-based ICBMs. It is the Navy's only survivable means of nuclear command and control.

Program Status: In order to sustain and improve E-6B capability, the Block I modification program was developed. The contract for Block I was awarded to Rockwell Collins in March of 2004 and is designed to repair a number of aircraft deficiencies identified by the Strategic Command. IOC is planned for 2010.

EA-6B Prowler
Electronic Warfare Aircraft

Description: The EA-6B Prowler provides Electronic Attack (EA) and Anti-Radiation Missile (ARM) capabilities against enemy radar and communications systems. In addition to enhancing the strike capabilities of carrier air wings and Marine expeditionary forces, an expeditionary Prowler force has provided Airborne Electronic Attack (AEA) during numerous joint and allied operations since 1995 by denying an adversary's use of radar and communications. These capabilities were most recently demonstrated during the Global War on Terrorism where EA-6B support of operations in Afghanistan and Iraq protected coalition aircraft and disrupted critical communications links. The enormous demand for EA in Operations Enduring Freedom and Iraqi Freedom drove EA-6B utilization rates to record levels.

Program Status: To address increased wing fatigue life expenditure, congressional supplemental funding has allowed accelerated procurement of Wing Center Sections and additional procurement of Outer Wing Panels. The Block 89A upgrade program reached IOC in FY 2000 and corrects structural and supportability problems and improves the Prowler's avionics and joint interoperability capabilities. The Improved Capability (ICAP) III upgrade, planned to reach IOC in FY 2005 includes a completely redesigned receiver system (ALQ-218). Most significantly, the ALQ-218 will form the heart of the AEA system installed in the EA-6B follow-on platform, the EA-18G.

Developer/Manufacturer:
Northrop Grumman, Bethpage, New York.

EA-18G Super Hornet
Airborne Electronic Attack Aircraft

Description: Following a two-year Airborne Electronic Attack Analysis of Alternatives (AEA AoA), the Navy selected the EA-18G to replace the aging EA-6B Prowler (see above). The EA-18G is a derivative of the two-seat,twin-engine F/A-18F Super Hornet incorporating a repackaged ALQ-218 AEA system from the ICAP III EA-6B Prowler. Like the Prowler, the EA-18G will provide full-spectrum electronic attack to counter enemy air defenses and communication networks. The EA-18G will use existing ALQ-99 jamming pods currently employed on the EA-6B. However, the tactical aircraft's expanded flight envelope offers much greater speed,altitude,and maneuverability. The EA-18G will maintain a high degree of commonality with the F/A-18F, retaining the latter's strike-fighter and self-protection capabilities, while providing air-to-air self-escort to free other assets for other strike-fighter tasking.

Program Status: EA-18G program start (Milestone B) is scheduled for first quarter FY 2004 with a planned IOC in FY 2009. An inventory objective of 90 aircraft is planned to support a 10-squadron force structure. Initial procurement of the first four aircraft begins in FY 2006.

Developer/Manufacturer: Boeing, St. Louis, Missouri; Northrop Grumman, Bethpage, New York.

F/A-18 A-D
Hornet Strike-Fighter Aircraft

Description: The F/A-18 Hornet is Naval Aviation's principal strike-fighter. This state-of-the-art, multi-mission aircraft serves the Navy and Marine Corps,as well as the armed forces of several allied and friendly countries. Its reliability, maintainability, safety record, high performance, and multiple weapons-delivery capability highlight the Hornet's success. Budgeted improvements to the original Hornet A/C/D variants have provided significant warfighting improvements, including the addition of the Global Positioning System, Multi-Functional Information Distribution System (MIDS),AIM-9X Sidewinder/Joint Helmet-Mounted Cueing System, Combined Interrogator Transponder, Joint Direct Attack Munition/Joint Stand-Off Weapon (JDAM/JSOW) delivery capability, and Digital Communication System for close-air support. The aircraft's weapons, communications, navigation, and Defensive Electronic Countermeasures systems are also being upgraded to ensure combat relevance.

Program Status: Although the F/A-18A through D are out of production, the existing inventory of more than 750 Navy and Marine Corps aircraft will continue to comprise half of Naval Aviation's strike assets through 2012.

Developer/Manufacturer: Boeing, St. Louis, Missouri; and General Electric, Lynn, Massachusetts.

F/A-18E/F
Super Hornet Strike-Fighter Aircraft

Description: The F/A-18E/F Super Hornet reached IOC in 2001, providing significant improvements in combat range, payload, survivability, and growth capacity required to keep the strike-fighter force lethal and viable well into the 21st century. There is extensive commonality with weapons systems, avionics, and software between F/A-18 variants, and the infrastructure supporting the Super Hornet builds upon existing organizations. Ultimately, the F/A-18E/Fs will replace F-14s and older F/A-18s. The lethality, flexibility, reliability, and survivability of the F/A-18E/F make it the right aircraft to fulfill missions associated with regional and littoral conflicts.

Program Status: Aircraft F/A-18E-1 completed its first flight on 29 November 1995. Through April 2004,the F/A-18E/F has flown more than 118,000 hours in testing and fleet operations. The F/A-18E/F concluded OPEVAL in November 1999 and received a grade of "Operationally Effective and Operationally Suitable." All Low Rate Initial Production aircraft have been delivered and full-rate production deliveries commenced in October 2001. The Navy awarded a multi-year contract for the procurement of 222 aircraft through the years 2000-2004, saving the taxpayers more than 7.4 percent, or $700 million,as compared to five single-year contracts.A second multi-year contract was awarded in FY 2004 for 210 aircraft procured in 2005 through 2009, saving the taxpayer more than $1 billion over the single year price. Additionally, in June 2002 the Navy awarded a multi-year contract for the production of 480 engines, saving the taxpayers $51 million. The first Super Hornet squadron to deploy, VFA-115 (F/A-18E), deployed onboard the USS *Abraham Lincoln* (CVN-72) in the summer 2002. The second and third Super Hornet squadrons to deploy, VFA-14 (F/A-18E) and VFA-41 (F/A-18F), deployed onboard the USS *Nimitz* (CVN-68) in the spring of 2003. The second deployment initiated Early Operational Capability (EOC) for the Shared Reconnaissance Pod (SHARP), the Joint Helmet Mounted Cueing System (JHMCS), the Multifunctional Information Distribution System (MIDS), and the Advanced Targeting Forward-Looking Infra-Red (ATFLIR) system. Additionally, ATFLIR achieved Initial Operational Capability (IOC) with VFA-102 in September 2003. Lot 25 F/A-18E/Fs and above will have Advanced Mission Computers with computer software using Higher Order Language (HOL). The first Lot 25 Super Hornet was delivered in November 2002. Pacific Fleet aircraft will be based at NAS Lemoore, California, and the first Super Hornet squadron was forward deployed to Naval Air Facility (NAF) Atsugi, Japan in November 2003. Naval Air Station (NAS) Oceana, Virginia, and Marine Corps Air Station (MCAS) Cherry Point, North Carolina, have been chosen as the Atlantic Fleet home bases.

Developer/Manufacturer: Boeing, St. Louis, Missouri; and General Electric, Lynn, Massachusetts.

JSF
F-35 Joint Strike Fighter

Description: The F-35 Joint Strike Fighter program will deliver to the United States a transformational family of next-generation strike aircraft that combines stealth and enhanced sensors to provide a lethal, survivable, supportable and most importantly affordable tactical jet aviation strike fighter that complements the F/A-18 E/F and EA-18G. The Navy's Carrier Variant (CV), the Marine Corps Short Takeoff and Vertical Landing (STOVL) and USAF Conventional Takeoff and Landing (CTOL) "family of aircraft" design ensures a high level of commonality while concurrently meeting unique U.S. service and allied needs. The keystsone of this effort is a mission systems avionics suite that enables unparalleled interoperability between the U.S. armed services and coalition partners. F-35 acquisition will result in continued U.S. and allied technological and combat aircraft superiority. The focus of the JSF effort is to reduce the costs of developing, producing and operating these aircraft, while meeting future warfighting requirements. The F-35 program is accomplishing this by facilitating the development of fully validated operational requirements, and by exploring, investing in, and demonstrating key leveraging technologies and operational concepts.

Program Status: In October 2001 Lockheed Martin was selected to build the JSF and the JSF program transitioned to the System Development and Demonstration (SDD) phase. In June 2003,the JSF program completed an Air System Preliminary Design Review (PDR) and the first engine test of the Pratt and Whitney F135 was demonstrated in October 2003. The program conducted a Design Integration and Maturation Review (DIMR) for the CTOL/Common variant in April 2004. The first SDD flight is scheduled for third quarter FY 2006 (CTOL version) and the first STOVL flight is expected in the third quarter FY 2007. The first operational naval aircraft, the Marine Corps STOVL variant, will be delivered in FY 2010 and will IOC in 2012. The Navy's carrier variant will deliver in FY 2011 with an IOC in 2013. The first JSF training base will be determined under the umbrella of the DoD Base Realignment and Closure Commission (BRAC) 2005 process.BRAC will identify a suitable initial training base that can fulfill all three services' training requirements. In addition, the BRAC process will identify potential operational bases suitable for each service's needs. Agreements for international participation in SDD have been negotiated with the United Kingdom, Canada, Denmark, Italy, Norway, the Netherlands, Turkey and Australia. Security Cooperation Partnership MOUs have been established with Israel and Singapore.

Developer/Manufacturer: Lockheed Martin, Fort Worth, Texas; Pratt Whitney (PWF 135 engine) , East Hartford ,Connecticut ; and General Electric, Evansdale,Ohio (GEF136 engine program).

MV-22
Osprey Joint Advanced Vertical Aircraft

Description: The MV-22 Osprey is a tilt-rotor, Vertical/Short Take-Off or Landing (V/STOL) aircraft designed as the medium-lift replacement for the Vietnam-era CH-46E and CH-53D helicopters. The MV-22 design incorporates advanced technologies in composite materials, survivability, airfoil design, fly-by-wire controls, digital avionics, and manufacturing. The MV-22 is capable of carrying 24 combat-equipped Marines or a 10,000-pound external load, and has a strategic self-deployment capability of 2,100 nautical miles with a single aerial refueling. It is overwhelmingly superior to the CH-46E it replaces—twice the speed, five times the range, and three times the payload capacity. The MV-22's 38-foot rotor system and engine/transmission nacelle mounted on each wingtip allow it to operate as a helicopter for take-off and landing. Once airborne, the nacelles rotate forward 90 degrees, converting the MV-22 into a high-speed (ca. 250 knots), high-altitude (ca. 25,000 feet), fuel-efficient turboprop aircraft. The MV-22 represents a revolutionary change in aircraft capability to meet expeditionary mobility needs for the 21st Century. A Special Operation Forces (SOF) variant, CV-22, is under development, and the Navy is programmed to begin procurement of an MV-22 in the future.

Program Status: The V-22 is nearing the end of developmental testing and will undergo Operational Evaluation (OPEVAL) in late 2004/early 2005. Approximately 48 LRIP aircraft have been procured in six lots to support V-22 OPEVAL and initial fleet fielding, ten of which have been delivered to the Marine Corps through the end of CY 2003. The total flight hours for the V-22 program as of November 2003 were approximately 5,975 hours. The FY 2005 budget request contains eight MV-22s and three CV-22s. Once in Full Rate Production, the aircraft procurement rate will ramp-up to approximately 48 aircraft per year. The program of record includes 360 MV-22s for the Marine Corps, 50 CV-22s for USSOCOM, and 48 MV-22s for the Navy, for a total of 458 V-22 aircraft.

Developer/Manufacturer: Bell Helicopter Textron, Fort Worth, Texas; Boeing Defense and Space Group, Helicopter Division, Philadelphia, Pennsylvania; and Rolls Royce, Indianapolis, Indiana.

J-UCAS
Joint Unmanned Combat Air System

Description: Since 2000 the Navy's Office of Naval Research has partnered with the Defense Advanced Research Projects Agency (DARPA) to define and demonstrate the value and feasibility of Unmanned Combat Air Vehicles (UCAVs). Through contracts with Boeing and Northrop Grumman, the DARPA/ONR effort explored the potential for naval UCAV applications and produced operational system concepts. The Navy directed the demonstration project to explore multi-mission vehicles that cover surveillance/reconnaissance, strike, and suppression of enemy air defenses. The Navy has stressed an initial emphasis on

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MV-22 ➢

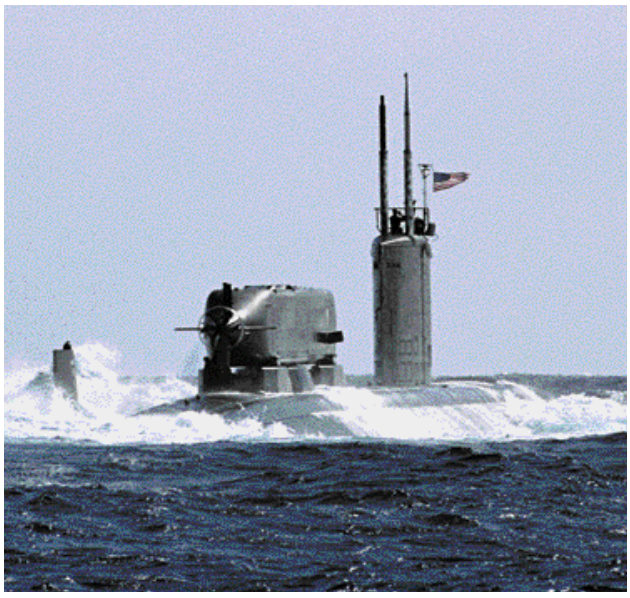
the penetrating surveillance/reconnaissance role, where target identification and precise location capability best leverages the significant Navy investment in stand-off weapons. The Navy effort has been combined with the Air Force into a joint program, J-UCAS. The program office is headed by DARPA and is focusing on an Operational Assessment starting in FY 2007-2009 that will assess the combined missions for the Navy and Air Force. The primary focus for the Navy remains on carrier basing of the envisioned low-observable, multi-mission unmanned vehicle. In addition, it will reduce risk in other areas in preparation for the follow-on acquisition program. This acquisition program will field aircraft carrier-based Navy UCAVs in the 2015 time frame.

Program Status: The Joint Systems Management Office, JSMO, stood up October 2003. The program office is pursuing the design of three airframes, X-45C, X-45CN, and X-47B. Detailed planning is now underway for a demonstration phase and follow on operational assessment. While maintaining the goal of demonstrating a carrier-based multi-mission UCAV the current program intends to develop a joint C4ISR and command and control architecture for the family of J-UCAS vehicles.

Developer/Manufacturer: To be determined.

Surface and Expeditionary Warfare Ships and Craft

ASDS
Advanced SEAL Delivery System

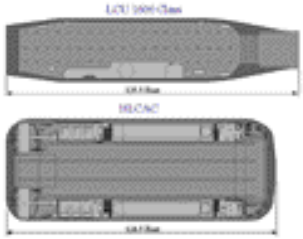


Description: This dry mini-submarine is 65 feet long, operated by a two-man crew, and can carry Navy Sea-Air-Land (SEAL) personnel or other services' Special Operations Forces (SOF). The ASDS is a multi-mission platform capable of personnel and sensor delivery and support. It will be launched either from a host submarine, much like the Deep Submergence Rescue Vehicle (DSRV), or from the well decks of amphibious ships. The ASDS eliminates the extended exposure to water and increased atmospheric pressure inherent with in-service wet submersible SEAL Delivery Vehicles (SDVs),and carries improved sensors and communications equipment, resulting in improved personnel and equipment performance.

Program Status: The U.S.Special Operations Command requirement is for six ASDSs. The first ASDS is homeported with SEAL Delivery Vehicle Team One (SDVT ONE) in Pearl Harbor, Hawaii. Other systems are scheduled to be home-ported in Pearl Harbor and Little Creek, Virginia (SDVT TWO). The ASDS completed OPEVAL in Summer 2003. Progress toward building the full complement of six ASDS is dependent on the resolution of ongoing technical issues with its batteries and sound signature. Two SSNs are currently configured to host the ASDS. Modifications to additional in-service submarines that will host the ASDS will be completed as the program proceeds.

Developer/Manufacturer:
Northrop Grumman, Annapolis, Maryland.

HLCAC
Heavy Lift Landing Craft, Air Cushion



The HLCAC is a promising option for providing high-speed, heavy-lift for over-the-horizon maneuver, surface lift, and shipping. The Phase 2 LCAC SLEP (see LCAC program summary) is capable of lifting 72 tons in extreme environmental conditions. The HLCAC could carry up to 144 tons,thus increasing capacity without additional platforms. A HLCAC is created by modifying the current LCAC by incorporating planned SLEP improvements,increasing the length by approximately 37 feet, enhancing the lift fans and propellers,and adding two engines. These design modifications allow the HLCAC a 100 percent load capacity increase in armored combat vehicles (tanks and light armored vehicles) and heavy logistics loads. With HLCAC, the same combat buildup ashore can be accomplished with half the usable beach length, thus requiring fewer assault breaching lanes. HLCAC also enables more efficient utilization of well deck space by allowing commanders to pre-load the same number of combat armored vehicles in fewer craft, potentially providing up to 25,000 square feet of additional vehicle stowage.

Program Status: RDT&E begins in FY 2004, and the first craft is projected for FY 2009. Force mix (numbers of LCAC and HLCAC) remains to be determined but present plans call for inducting two craft into the SLEP/HLCAC line and producing one HLCAC.

Developer/Manufacturer: TBD

LCAC
Landing Craft, Air Cushion

Description: This high-speed, fully amphibious landing craft is capable of carrying a 60-ton payload (75 tons in overload) at speeds in excess of 40 knots and a nominal range of 200 nautical miles. Its ability to ride on a cushion of air allows it to operate directly from the well decks of amphibious warships. Carrying equipment, troops, and supplies, the LCAC launches from the well deck, transits at high speed, traverses the surf zone and lands at a suitable place ashore where it quickly offloads and returns to amphibious shipping for follow-on sorties. LCACs provide amphibious task force commanders flexibility in selecting landing sites, permitting access to more than 70 percent of the world's beaches as compared with 17 percent for conventional landing craft. LCACs deliver vehicles and cargo directly onto dry land rather than in the surf zone. LCACs are multi-mission craft that could also conduct alternate missions when outfitted with appropriate mission packages.

A Service Life Extension Program (SLEP) to extend hull life from 20 to 30+ years for the 74 active LCACs will be accomplished in two phases. Phase 1 updates critical electronics (radar and radios) and provides for corrosion abatement. Phase 1 SLEP is to complete by 2010, to coincide with the fielding of the Expeditionary Fighting Vehicle (EFV). Through 2016 and as part of Phase 2 SLEP, the Navy will look to incorporate other service-life enhancements,including:

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LCAC ➢

- **An open-architecture concept, relying on modern commercial-off-the-shelf (COTS) equipment that will allow much easier incorporation of later technology changes, such as the precision navigation system and communications systems, fully interoperable with in-service and near-term future joint systems now planned**
- **Engine upgrades (ETF-40B configuration) that will provide additional power and lift, particularly in hot (100 degrees F and higher) environments, reduced fuel consumption, reduced maintenance needs,and reduced lift footprint**
- **Replacement of the buoyancy box to solve corrosion problems, incorporate hull improvements, and "reset" the fatigue-limit "clock"**
- **Incorporation of a new (deep) skirt that will reduce drag, increase performance envelope over water and land,and reduce maintenance requirements**

Program Status: IOC was achieved in 1986. Contracts for 91 LCACs were approved through FY 1997, with all 91 craft delivered to the Fleet by the end of 2000. Seven of these have been disassembled for Government-Furnished Equipment (GFE), ten are in Reduced Operating Status (ROS), two are held for R&D. The LCAC SLEP began in late 2000. Five LCACs are planned for FY 2005 with 23 additional SLEPs planned in the out-years.

Developer/Manufacturer: Textron Marine and Land Systems, New Orleans, Louisiana.

Weapons

Airborne

AGM-84E SLAM and AGM-84H/K SLAM-ER Standoff Land-Attack Missile (Expanded Response)

Description: The Standoff Land-Attack Missile (SLAM) is based on the highly successful and reliable Harpoon anti-ship missile, with a Global Positioning System-aided Inertial Navigation System (GPS/INS) for mid-course guidance, a Maverick imaging infrared sensor, and a Walleye data link for precise, "man-in-the-loop" terminal guidance. SLAM provides the capability to conduct over-the-horizon attacks with precision.

As Naval Aviation's follow-on to the SLAM Standoff Outside Area Defense (SOAD) weapon, SLAM-ER is a day/night, adverse-weather, precision-strike weapon with a range of more than 150 nautical miles. SLAM-ER provides the Navy and Marine Corps with improved precision-strike capability. A modified Tomahawk warhead improves lethality and penetration, while new planar wings double the range and allow terrain-following flight. Mission-planning time has been reduced to less than 30 minutes, and targeting has been improved via a "freeze frame" command that reduces pilot workload. SLAM-ER's effectiveness has been further increased with inclusion of an Automatic Target Acquisition (ATA) capability, making it a fully autonomous weapon and enhancing the missile's capability against small targets

and targets in urban environments. ATA uses a matching algorithm to recognize the aimpoint and surrounding scene, reducing or eliminating manual pilot intervention via a data link, while providing precise aimpoint placement. SLAM-ER also has an anti-ship capability and is testing land moving target capability.

Program Status: SLAM reached IOC in 1991 and was procured through FY 1995. In May 2000,SLAM-ER completed all developmental and operational testing and received approval to enter into full rate production. The Navy will have procured 488 tactical SLAM-ERs through FY 2004.

Developer/Manufacturer: Boeing, St. Louis, Missouri.

AGM-88 HARM
High-Speed Anti-Radiation Missile

Description: A joint-service program with the Navy as lead service, HARM is the Navy's only anti-radiation, defense-suppression, air-to-surface missile. Employed successfully in naval operations for decades,HARM is designed to destroy or suppress broadcasting enemy electronic emitters,especially those associated with radar sites used to direct anti-aircraft guns and surface-to-air missiles. The AGM-88B (Block IIIA) and the AGM-88C (Block V) are the current fielded fleet configurations of the HARM.

The next evolution to the HARM weapon system is the AGM-88E Advanced Anti-Radiation Guided Missile (AARGM). The AARGM program is an ACAT-IC program and is currently in SDD. The AGM-88E SDD program is the continuation of the successful Quick Bolt ACTD, which was sponsored by EUCOM and completed in FY03. The AGM-88E project seeks to improve on legacy HARM by adding an improved ARM detection system and an improved counter-shutdown capability via GPS guidence and a millimeter wave terminal seeker. AARGM also provided a netted situation awareness / targeting capability and weapon impact assessment reporting via direct integration with national technical means.

Program Status: FY 1992 was the last year of production of all-up HARM rounds. The AGM-88E AARGM program is in SDD with IOC planned in FY 2009. The AGM-88E program will convert 1,750 older AGM-88 weapons for the F/A-18C/D/E/F and EA-18G platforms.

Developer/Manufacturer: Raytheon, Tucson, Arizona. AARGM: ATK Missile Systems Company, Inc., Woodland Hills, California.

AGM-154 JSOW
Joint Standoff Weapon

Description: A new family of Stand-off Outside Point Defense (SOPD) weapons was added to the Fleet with the introduction of the Joint Stand-Off Weapon (JSOW) in 1999. A joint Navy-Air Force weapon-development program, with the Navy as the lead service, JSOW replaces five types of the aging air-to-ground weapons currently in the naval inventory. With war-proven effectiveness, the JSOW family of precision-guided weapons allows

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AGM-154 JSOW ➢

naval aircraft to attack targets at increased standoff distances, greatly increasing aircraft and aircrew survivability. The JSOW is usable in adverse weather conditions,and gives aircrews the ability to attack multiple targets in a single sortie. The JSOW family uses a common weapon body or "truck" for all variants. The AGM-154A variant carries BLU-97 combined-effect bomblets for use against area targets. The AGM-154C (Unitary),is being developed with a penetration warhead (BROACH).

Program Status: AGM-154A reached IOC in 1999, and the AGM-154C variant will reach IOC in FY 2004. Procurement continues across the FYDP, with 2,254 JSOWs programmed, including 468 in FY 2004. The program procures 231 JSOW A and 97 JSOW C in FY 2004; and 216 JSOW A and 173 JSOW C in FY 2005; and 874 JSOW A and 894 JSOW C in the out-years (FY 2006-2009).

Developer/Manufacturer: Raytheon: Tucson, Arizona.

AIM-9X
Sidewinder Short-Range Air-to-Air Missile

Description : A major modification to the AIM-9M Sidewinder, the AIM-9X is a joint USN/USAF program that upgrades the missile with a staring focal plane array in the seeker, an extremely agile airframe,and state of the art signal processors resulting in enhanced target acquisition, missile kinematics, and improved infrared counter-countermeasures capabilities. The missile will provide the U.S. fighters with air superiority well into the century. When coupled with the Joint Helmet-Mounted Cueing System, the Sidewinder's high off-boresight capability will revolutionize the way these air-to-air missiles are employed. Current integration includes the F/A-18A+/C/D Hornet with integration on the F/A-18E/F Super Hornet underway and an expected IOC in late 2004.

Program Status: Operational testing was completed in Summer 2003. The first Low Rate Initial Production (LRIP) contract deliveries began in September 2002 with the second and third LRIPs awarded in November 2002 and November 2003 respectively. Approval for the fourth LRIP was received July of 2003 and Full Rate Production approval was received May of 2004. The program funds 940 AIM-9X missiles in the FYDP, including 152 in FY 2005.

Developer/Manufacturer: Raytheon, Tucson, Arizona.

AIM-120 AMRAAM
Advanced Medium-Range Air-to-Air Missile

Description: The AIM-120 AMRAAM missile is deployed on the F/A-18A+/C/D Hornet and the F/A-18E/F Super Hornet and will be deployed on the EA-18G and Joint Strike Fighter (JSF) aircraft (see separate program summaries for these aircraft). Joint U.S. Air Force and Navy procurement of AMRAAM continues and deliveries of the AIM-120C are under way. The AIM-120C Pre-Planned Product Improvement (P3I) Program is a key factor in maintaining medium-range air superiority. This modernization plan includes clipped wings for internal carriage, a propulsion enhancement program, increased warhead lethality, and

enhanced electronic counter-countermeasures (ECCM) capabilities through hardware and software upgrades. Ultimately, AMRAAM will be the Department of the Navy's sole Medium/Beyond Visual Range (M/BVR) missile. As part of the continuing weapons neck-down strategy, the radar-guided AIM-54C Phoenix and AIM-7 Sparrow are being phased out and no further software or hardware improvements are planned for these legacy weapons.

Program Status: Deliveries of the AIM-120C began reaching the Fleet in 1996. The AIM-120C-7 configuration is a product of P3I Phase 3 and is scheduled to achieve IOC in FY 2005. Continued procurement of the joint AMRAAM, with a P3I Phase 4 contract, will provide significant network-centric warfare capability, improved high-off-boresight capability and missile kinematics. Phase 4 AMRAAM is scheduled to IOC in FY08. Planned procurement across the FYDP is 587 missiles, including 46 in FY 2005.

Developer/Manufacturer: Raytheon, Tucson, Arizona.

GBU-10/12/16/24
Laser-Guided Bomb

Description: The Laser-Guided Bomb (LGB) is a joint DoN/USAF effort with the Air Force as the lead/executive service for procurement. LGBs include Paveway I, which has been retired; Paveway II,the current variant (GBU-10,12,and 16) that uses Mk 80/BLU series general-purpose bomb bodies; and Paveway III (GBU-24) that uses the BLU-109 bomb body incorporating state-of-the-art guidance and control features. Paveway II LGBs are designated GBU-12 (500 pound class), GBU-16 (1,000 pound class),and GBU-10 (2,000 pound class). An LGB is comprised of an Mk 80/BLU-series warhead fitted with a laser-guidance kit consisting of a computer control group (CCG), mounted on the nose of the bomb body, and a rear-mounted airfoil group (AFG). The warhead is initiated by an electronic fuse housed in the aft section of the bomb body. The seeker, housed in the CCG, senses laser energy and sends signals to the CCG canards to guide the weapon to the reflected energy spot. The laser energy can be applied to the target by ground or airborne designators,and even self-designated by laser-configured aircraft.

Program Status: Procurement continues across the FYDP with 8007 LGBs programmed in FY 2004, 5536 LBGs in FY 2005, and 9348 LGBs in FY 2006-2009.

Developer/Manufacturer: Raytheon Company, Tucson, Arizona, and Lockheed Martin, Bethesda, Maryland.

GBU-31/32/38 JDAM
Joint Direct Attack Munition

Description: The Joint Direct Attack Munition (JDAM) is a multi-service effort, with the Air Force as the lead service, for a strap-on, Global Positioning System-aided, Inertial Navigation System (GPS/INS) guidance kit to improve the accuracy of existing 500-pound, 1,000-pound and 2,000-pound general-purpose

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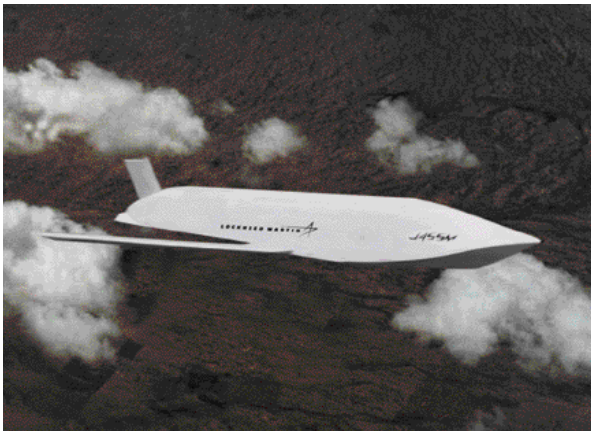
GBU-31/32/38 JDAM➢

and penetrator bombs in all weather conditions. JDAM is a true force multiplier, allowing a single aircraft to attack multiple targets from a single release point, and has been proven in recent operations in Iraq, Kosovo and Afghanistan.

Program Status: LRIP for the 2,000-pound kits began in FY 1997, and Milestone III was reached in FY 2001. The 1,000-pound JDAM kit reached IOC in FY 2002, and IOC for the 500-pound weapon is planned for FY 2004. Procurement of JDAM continues with 42,802 JDAMs programmed across the FYDP, including 12,326 in FY 2004. MK82 IOC is scheduled for the second quarter of FY 2005. The program acquired 12,326 kits in FY 2004 and will acquire 6,620 kits in FY 2005, and 14,910 kits across the FYDP.

Developer/Manufacturer: Boeing, St. Louis, Missouri.

JASSM
Joint Air-to-Surface Stand-off Missile



Description: JASSM is an Air Force-led, long-range, totally autonomous ground-attack missile that provides precision capability against highly defended targets. JASSM employs a J-1000 penetrator warhead capable of destroying various targets from re-locatable, non-hardened, above-ground targets; to fixed, hardened, shallow-buried, point targets. JASSM is capable of operating in adverse weather and is able to survive in the advanced threat environment. JASSM provides Standoff Outside Area Defense Missile Capability.

Program Status: JASSM is currently undergoing integration on the F/A-18E/F and is slated to reach IOC for the Navy in FY 2009. The Navy budget includes a total of 30 JASSMs in FY 2008,110 in FY 2009,and 110 in FY 2010.

Contractor: Lockheed Martin.

JCM
Joint Common Missile

Description: The JCM is a follow-on reactive precision-guided missile to replace Maverick, Hellfire, and TOW (Tube-launched Optically-tracked Wire-guided). The Army is the lead service for acquisition of this weapon, which is the Strike Operational Advisory Group's (OAG) number-one priority. The JCM will provide fixed-wing aircraft and helicopters with a precision weapon that is designed to kill moving and short-dwell re-locatable targets. The weapon system includes a precision multi-mode seeker with fire-and-forget capability, a dual-mode warhead and an advanced launcher for fixed wing aircraft. The JCM will provide twice the engagement range of Hellfire. No other weapon is currently capable of providing reactive targeting. Replacement of Hellfire/Maverick/ TOW is a significant issue for Naval Aviation in order to prosecute the assigned target set effectively.

Program Status: The JCM is scheduled with the procurement of 22 missiles in FY 2008. An additional 88 missiles will be procured in FY 2009.

Contractor/Developer: Lockheed Martin.

Subsurface, Surface, and Expeditionary

AGS
Advanced Gun System

Description: The 155mm Advanced Gun System (AGS) is planned for installation in the DD(X) destroyer (see separate program summary) to provide high-volume, precision, sustainable fires in support of the joint land battle. AGS is a fully integrated gun weapon system that will include two separate gun systems for each DD(X) warship. Each gun system will be capable of independently firing up to 10 rounds per minute from a fully automated magazine. The AGS program includes development of the GPS guided 155mm Long-Range Land-Attack Projectile (LRLAP), the first of a family of AGS munitions. AGS is being designed to meet the reduced manning and radar-signature requirements of DD(X).

Program Status: The program started in FY 1999 and is an integral part of the DD(X) program .The first gun system is scheduled for delivery in FY 2008, to support the first DD(X) fleet delivery in FY 2011.

Developer/Manufacturer: United Defense Limited Partnership, Minneapolis, Minnesota,in partnership with the DD(X) industry team led by Northrop Grumman Ship Systems and Raytheon.

ATWCS/TTWCS
Advanced Tomahawk/
Tactical Tomahawk Weapon Control System

Description: ATWCS is an evolutionary upgrade to the current Tomahawk Weapon Control System. ATWCS uses COTS/GOTS hardware and software to reduce overall reaction time and operator workload, enhance training capabilities at all levels, and improve the Tomahawk Land-Attack Missile's (TLAM) effectiveness. ATWCS incorporates an open system architecture to provide for future growth, eliminates stand-alone Tomahawk desktop computers, and enhances command-and-control interoperability. It will be phased-in through two releases: Track Control Group Replacement (TCGR) and Launch Control Group Replacement (LCGR). TTWCS is a significant upgrade to the Tomahawk Weapon System and incorporates an ATWCS COTS/GOTS refresh. TTWCS provides the firing platform the ability to conduct mission planning and coordination functions, monitor Battle Damage Indication and Imagery (BDII), flex in-flight TLAMs to alternate preplanned aimpoints, and receive in-flight health and status updates from the missile. Most significantly, TTWCS provides the ship with the onboard ability to plan Global Positioning System (GPS)-only Tactical TLAM missions and retarget in-flight Tactical TLAMs to new GPS coordinates. TTWCS will be fully compatible with all versions of TLAMs.

Program Status: ATWCS: TCGR reached IOC in September 1998. LCGR reached IOC in 2000. Funding support for ATWCS, balanced against other requirements, is within available resources. TTWCS has completed Developmental Testing and Operational Evaluation. The Block III weapon control system

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ATWCS/TTWCS➢

capability IOC in 2003 allowed TTWCS to shoot Block IV missiles. Full Block IV IOC is expected in Fiscal Year 2004 with introduction of the Tactical Tomahawk missile. The USS Stethem (DDG-63) in 2002 launched a Block III Tomahawk missile using the new Tactical Tomahawk Weapons Control System, successfully testing Launch Platform Mission Planning (LPMP). LPMP enables individual ships and submarines to plan and execute Tomahawk cruise missile strikes with both the Block III and Tactical Tomahawks. TTWCS program procurement rate has been constrained by available resources.

Developer/Manufacturer: Hardware: Boeing, St. Louis, Missouri; Litton, San Diego, California. Software: Telos, Ashburn, Virginia; Raytheon, San Jose, California; Southeastern Computers Consultants, Inc., Austin, Texas; Lockheed Martin MDS, Valley Forge, Pennsylvania; Naval Surface Warfare Center, Dahlgren, Virginia; and Marconi, San Diego, California.

BGM-109/UGM-109 TLAM
Tomahawk/Tactical Tomahawk Land-Attack Cruise Missile

Description: The Tomahawk Land-Attack Missile (TLAM) is the Navy's premier, all-weather, long-range, subsonic land-attack cruise missile deployed on surface warships (BGM-109) and attack submarines (UGM-109 on both SSNs and SSGNs). The TLAM/C variant is armed with a unitary conventional warhead, while the TLAM/D variant is armed with submunitions. The original TLAM's guidance incorporated an onboard Inertial Navigation System (INS) and a Terrain Contour Matching (TERCOM) system that correlates actual terrain contour with stored terrain contour. Additional accuracy was attained through multiple Digital Scene Matching Area Correlation (DSMAC) updates, which take digital pictures of the terrain and compare them with stored digital maps. The TLAM Block III upgrade improves accuracy and global strike capability with the addition of Global Positioning System (GPS) guidance capability, improved DSMAC IIA, and increased range. Tactical Tomahawk, the Block IV upgrade to TLAM, will preserve Tomahawk's long-range precision-strike capability while significantly increasing responsiveness and flexibility at significantly lower cost. Tactical Tomahawk improvements include:

- **In-flight retargeting**
- **Ability to loiter over the battlefield and to respond to emergent targets**
- **Ability to monitor the health and status of the missile in flight via a satellite data link**
- **Battle Damage Indication Imagery capability that gives a digital look-down "snapshot" of the battlefield and sends it via satellite data link**
- **GPS mission planning onboard the launch platform, enabling the shooter to plan and rapidly execute strike missions against emergent battlefield targets**
- **Improved anti-jam GPS that minimizes the susceptibility to jamming**

➢ **A missile design that allows for alternative payloads, including smart submunitions,a penetrator warhead, and multiple response warhead.**

Program Status: Tactical Tomahawk program began in FY 1998, and IOC is planned for FY 2004. The Navy completed the first ground test of the Tactical Tomahawk missile in 2002, vertically launching the missile, which flew a fully guided 550-mile flight using the Global Positioning System (GPS) and digital scene matching area correlation navigation updates. Through the end of CY 2003, eight of eight successful flight tests from both surface ships and attack submarines demonstrated all system capabilities. Current plans call for the Navy to procure 2,691 Tactical Tomahawk missiles. Additional Tactical Tomahawk procurement is constrained by fiscal priorities.

Developer/Manufacturer:
Raytheon Missle Systems, Tucson, Arizona.

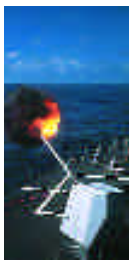
EX-171 ERM
Extended-Range Munition

Description: The Extended-Range Munition is a rocket-assisted projectile capable of carrying a Unitary blast-fragment warhead with an associated height-of-burst fuze. The 110-pound aerodynamic projectile is five inches in diameter and 61 inches in length and uses a coupled Global Positioning System/Inertial Navigation System (GPS/INS) guidance system. The guidance system is resistant to jamming, enabling the ERM to attack targets in an electronic countermeasures environment. Its long range and precise GPS targeting capability will improve Naval Surface Fire Support (NSFS) and provide gunfire support for expeditionary operations, suppression,and destruction of hostile anti- shipping weapons and air defense systems in support of the joint land battle.

Program Status: Milestone I/II was reached in July 1996,allowing the ERM to enter EMD. Developmental work continues as the program overcomes technical challenges. Work also continues on increasing lethality, designing the highly accurate guidance system that can withstand the harsh environment encountered during a gun firing, and other areas (including a cargo variant) to provide cost-effective, accurate, and lethal munitions that meet NSFS requirements.

Developer/Manufacturer: Raytheon, Tucson, Arizona.

Mk 45 Mod 4 Upgrade
Five-Inch/62-Caliber Gun System Upgrade



Description: The Mk 45 Mod 4 5-inch 62 Gun will significantly enhance Naval Surface Fire Support capabilities and provide fire mission flexibility for anti-surface and anti-air warfare. The 5-inch (127mm)/62-caliber Mk 45 Mod 4 gun incorporates structural improvements to accommodate higher energies required to fire Extended-Range Munitions and the current inventory of conventional 5-inch ballistic ammunition. Modifications include a longer (62-caliber) barrel, an Ammunition Recognition System, a Gun/ERM interface and a

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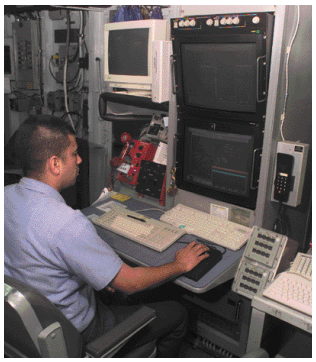
Mk45 Mod 4 Upgrade➢

digital control system. Modifications to the ammunition magazine for the Mk 45 Mod 4 gun have also been developed to facilitate stowage of the larger ERM rounds and assist shipboard ammunition handling personnel with handling and loading the heavier rounds. The Mk 45 Mod 4 gun is currently being forward-fit in *Arleigh Burke*-class Aegis destroyers (DDGs 81-112).

Program Status: Milestone I/II was reached in January 1996, allowing the Mk45 Mod 4 Gun to enter EMD. The Navy awarded the Mk 45 Mod 4 gun design and development contract on 5 February 1996. Three Mk 45 Mod 4 kits have been produced to facilitate development and testing. The first kit was installed in a proof of concept gun, which successfully completed testing in July 1997 at the Naval Surface Warfare Center, Dahlgren (NSWC/DD). Virginia. The second kit was installed in a government-furnished Mk 45 mount and began Land-Based Testing in August 1998 at NSWC/DD. The third kit was installed in a new Mk 45 gun that was shipped to Bath Iron Works in May 1999 and installed in the USS *Winston Churchill* (DDG-81) in November 1999. All critical exit criteria associated with land-based testing were met allowing for LRIP approval on 12 April 1999. The first phase of IOC (for conventional ordnance use) is April 2003. There are currently 10 DDG-51 destroyers equipped with the Mk 45 Mod 4 gun. The program's procurement rate has been balanced within available resources.

Developer/Manufacturer: United Defense Limited Partnership, Minneapolis, Minnesota.

NFCS
Naval Fires Control System



Description: The NFCS is the enabler for surface land-attack in network-centric warfare operations. It automates shipboard land-attack battle-management duties, and communicates with the ground force's primary fire support command and control network, the Advanced Field Artillery Tactical Data System (AFATDS).NFCS will be interoperable with joint C4ISR systems, providing the mission-planning and fire-support coordination functions required to support expanded mission capability afforded by the extended range and precision accuracy of the improved Mk 45 Mod 4 (5-inch/62-caliber) gun, Extended-Range Munition (ERM),and the Advanced Gun System (AGS).

Program Status: Milestone I/II was reached on 2 July 1999, allowing NFCS to enter EMD. The Navy awarded the NFCS Phase I design and development contract in July 1999. Program development and procurement is on track for installation on DDGs 81-112 and CGs 52-73. TECHEVAL 25-26 March 04, OPEVAL 26-30 April 04, and IOC is scheduled for September 2004. A total of 54 systems (32 DDG and 22 CG) are planned for fielding FY05-FY11.

Developer/Manufacturer: General Dynamics Information Systems (GDIS), Arlington, Virginia; GEC-Marconi Electronics Systems, Wayne, New Jersey; NSWC/DD, Dahlgren, Virginia; SPAWAR, San Diego, California; and NUWC, Keyport, Washington.

Multi-Platform

USQ-146 (V) RUBICON
Command and Control Warfare System

Description: The USQ-146 (V) Rubicon Command and Control Warfare system is a precision non-kinetic electronic warfare system designed for use on a variety of naval platforms. The USQ-146 employs hardware and software architectures suitable for air, surface, subsurface, vehicle mounted, and fixed-site installation.

Program Status: In production.

Developer/Manufacturer: Argon Engineering, Fairfax, Virginia, Rockwell Collins, Cedar Rapids, Iowa.

Sensors

Airborne

APG-79 AESA
F/A-18 Super Hornet Active Electronically Scanned Array (AESA)

Description: The Phase I upgrade provides multi-mode function flexibility while enhancing performance in the air-to-air arena, hostile electronic countermeasures environments and air-to-ground targeting functions. Phase II will provide significant electronic warfare improvements to target hostile emitters while providing aircraft electronic protection and electronic attack functions. Growth provisions will allow for reconnaissance capability through the use of synthetic aperture radar technology and improved hardware and software.

Program Status: The APG-79 completed subcontractor competition in November 1999,and the Engineering and Manufacturing Development (EMD) contract was awarded in February 2001 to reach IOC in FY 2006.AESA Total Phase I program procurement is 415 systems, 279 forward fit and 136 retrofit. AESA Milestone C and LRIP II approval was received in January 2004, for initial delivery with Lot 27 Super Hornets in FY 2005.

Developer/Manufacturer: Boeing, St. Louis, Missouri; and Raytheon, El Segundo, California.

ATFLIR
F/A-18 Advanced Targeting Forward-Looking Infra-Red

Description: The Advanced Targeting FLIR (ASQ-228) will provide the F/A-18A+/C/D/E/F with a significantly enhanced capability to detect, track,and attack air and ground targets. New laser-guided and GPS standoff weapons systems,and higher-altitude attack profiles, require improved performance over the current AAS-38/46 Targeting FLIR. The ATFLIR is designed to provide a quantum leap in operational effectiveness to support fully the standoff precision strike mission. Improved reliability and maintainability will increase operational availability while reducing total ownership costs.

ATFLIR ➢

Program Status: ATFLIR completed Phase I Operational Test and Evaluation in September 2003 and was determined to be operationally suitable and effective and recommended for further fleet introduction. ATFLIR achieved Initial Operational Capability (IOC) with VFA-102 in September 2003 and demonstrated its combat capability in support of Operation Iraqi Freedom (OIF). The program was awarded MS III/FRP decision on 17 October 2003. The Navy will procure 66 ATFLIR in FY 2005, with an ultimate goal for 526 systems to support TACAIR Integration.

Developer/Manufacturer: Boeing, St. Louis, Missouri; and Raytheon, El Segundo, California.

SHARP
Shared Reconnaissance Pod

Description: The Shared Reconnaissance Pod replaces the F-14 Tactical Airborne Reconnaissance Pod System (TARPS) and will be carried on the F/A-18F supporting strike warfare, amphibious warfare, and anti-surface warfare decision-making. SHARP provides near real time dual-band EO/IR medium and high altitude standoff. SHARP incorporates NITF formatted day/night digital imagery utilizing the USQ-123 Common Data Link-Navy (CDL-N) for real time connectivity. LRIP pods deployed with VFA-41 in support of OIF in 2003.

Program Status: SHARP MS III was scheduled for January 2004; FRP, in February 2004; and IOC,in June 2004. Currently, 21 pods are funded.

Developer/Manufacturer: Raytheon Indianapolis, Indiana; Recon Optical Inc., Barrington, Illinois.

Subsurface

BSY-2
Submarine Combat System

Description: The BSY-2 Submarine Combat System improves upon existing combat systems to meet the expanded operational requirements of the *Seawolf* (SSN-21)-class attack submarines. It is a fully integrated system used for sonar tracking, monitoring, and launch of all onboard weapons,including Mk 48 ADCAP/ADCAP MOD torpedoes, Tomahawk missiles, and naval mines. It provides improved overall response time, operability, tactical reconfiguration, firepower, and availability. Significant advancements include the hull-mounted Wide Aperture Array (WAA) for rapid localization of targets, a 92-processor node flexible architecture ("FLEXNET") using fiber-optic technology, and a fully integrated Interactive Electronic Technical Manual (IETM) supporting onboard and shore-based maintenance, operations, and training.

Program Status: Three systems were procured, with the first delivery to the USS *Seawolf* in February 1995 and the second delivery to the USS *Connecticut* (SSN-22) in October 1997. The BSY-2 system completed initial testing on *Seawolf* in the summer 1996 and was delivered to the Navy in the summer 1997. The third system will be installed on Jimmy Carter (SSN-23), currently under construction by General Dynamics Electric Boat Corporation (see separate program summary).

Developer/Manufacturer: Lockheed Martin, Syracuse, New York.

CCS Mk 2 Block 1C OSA Submarine Combat Control System Open System Enhancement

Description: Submarine Combat Control System Open System Enhancement Program, designated CCS Mk2 Block 1C, is a three-phase program for transforming various existing legacy submarine combat systems [BSY-1, CCS Mk1, CCS Mk2 D(0) and DWS-118] to a common, more capable and flexible COTS/Open System Architecture (OSA). The use of COTS/OSA technologies and systems will enable rapid periodic updates to both software and hardware. COTS-based processors will allow computer power growth at a rate commensurate with commercial industry. Phase I (CCS Mk2 Block 1C in FY 2000) introduces automated strike engagement planning capability (ATWCS) and *Virginia*-class data distribution and services. Phase II (CCS Mk2 Block 1C ECP 4 in FY 2002) introduces advanced weapons improvements and processing with the installation of *Virginia*-class equivalent COTS processors, replaces the existing UYK-43 computer with COTS hardware,and supports introduction of the coordinated strike warfare Tactical Tomahawk (TACTOM) missile and weapon control system (TTWCS). Phase III (CCS MK2 Block 1C ECP-5 in FY 2007) includes *Virginia*-class weapons launch improvements and provides an at-sea, end-to-end launcher testing capability.

Program Status: The second phase of CCS Mk 2 Block 1C is currently being installed.

Developer/Manufacturer: CCS Mk 1 and BSY-1 upgrades: Naval Underwater Warfare Center (NUWC), Newport, Rhode Island. Mk 2: Raytheon, Portsmouth, Rhode Island.

Sea Shield

Platforms

Aircraft

MH-60R/S
Seahawk Multi-mission Combat Helicopters

Description: The MH-60R and MH-60S multi-mission combat helicopters are the two pillars of the CNO's Naval Helicopter Concept of Operations for the 21st Century. Under the "Helo CONOPS," the Seahawk will deploy as companion squadrons embarked on the Navy's aircraft carriers, surface warships, and logistics ships. The MH-60R will provide surface and undersea warfare support to Sea Shield operations, with a suite of sensors and weapons that include airborne low frequency (dipping) sonar, electronic support measures, advanced forward looking infrared, and precision air-to-ground missiles. The MH-60S will provide mine warfare support for Sea Shield and will partner with the MH-60R for surface warfare missions—carrying the same Forward Looking Infrared and air-to-ground sensors and weapons. The MH-60S will be reconfigurable to provide Combat Search and Rescue and Naval Special Warfare support to joint theater operations. Airborne mine countermeasures operations will be accomplished using advanced sensor and weapons packages to provide detection,localization and neutralization to these anti-access threats. The MH-60S will anchor the fleet logistics role in carrier strike group and expeditionary strike group operations. The MH-60R/S platforms are produced with 85 percent common components to simplify maintenance and logistics and to maximize flexibility for training. For example, the two aircraft have common cockpit and dynamic components.

Program Status: The MH-60R is currently in developmental test and is scheduled for Milestone III in FY 2005. The Navy plans to acquire 254 MH-60Rs. The MH-60S was approved for full rate production in August 2002 and is currently undergoing scheduled block upgrades for combat and airborne mine countermeasure missions. The Navy plans to acquire 271 MH-60S.

Developer/Manufacturer: Lockheed Martin, Owego, New York, and Sikorsky, Stratford, Connecticut.

MMA
Multi-mission Maritime Aircraft

Description: The Multi-mission Maritime Aircraft (MMA) is projected to replace the P-3C Orion aircraft, which is approaching the end of its service life. MMA's transformational bottom-up architecture will tailor integration of its onboard mission suite with unmanned aerial vehicles and satellite-based systems and sensors to assure maritime access in support of the Sea Shield pillar of "Sea Power 21." MMA will provide unparalleled undersea warfare capability as well as significant anti-surface warfare and intelligence-surveillance-reconnaissance (ISR) capability as fallout benefits. MMA is envisioned to contribute to maritime

superiority through the incorporation of evolving network, sensor, and communications capabilities. It will assure battle force access across the open ocean, the littorals, and it will play a critical role in the Navy's ability to project power from the sea.

Transformational in both tactical and smart business applications, MMA will leverage global logistics support infrastructure and established advanced training applications.

Program Status: The MMA program received a Milestone 0 decision in March 2000 and explored concepts for MMA with industry. Included in the concepts was the integration of UAVs to augment MMA capability. An Analysis of Alternatives began in the summer 2000,and leveraged previous analyses and the results of the industry studies. The AoA concluded that manned aircraft are an essential element of providing broad area maritime and littoral ISR and that UAVs provide a transformational opportunity for obtaining additional capability for warfighters. In 2002, the Navy re-engaged industry in Component Advanced Development, concept refinement, architectures, and requirements validation. USD(AT&L) revised the acquisition strategy to focus MMA on P-3 replacement. The Operational Requirements Document was endorsed by the Navy Staff and received the required certifications from the Joint Staff in preparation for an early FY 2004 Milestone B (entry into System Development and Demonstration). At that time, a single system integrator will be selected to develop MMA. Initial Operational Capability for MMA is targeted for FY 2012. Milestone B DAB is scheduled for 27 May 2004. The single system integrator will be selected in May 2004 (of note, evaluation scheduled to complete in March 2004, with final brief of those results in May 2004).

Developer/Manufacturer: To be determined.

P-3C Orion
Modification, Improvement, and Sustainment

Description: The P-3C Orion provides effective undersea warfare, anti-surface warfare, and Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) capabilities to naval and joint commanders including support for carrier strike groups and expeditionary strike groups. The current force is 12 active and seven reserve squadrons. The Navy's P-3 roadmap focuses on three areas: Inventory sustainment, modernization, and re-capitalization to provide a force optimized for regional and littoral crisis and conflict. Specific program elements include:

Inventory Sustainment:A Service Life Assessment Program has been completed to determine what actions must be taken to safely extend the airframe service life. A program of Special Structural Inspections (SSIs), which will allow extension of P-3 service life, started in FY 2003. More comprehensive inspections and preemptive repairs will be performed under the Enhanced Special Structural Inspection (ESSI) program starting in FY-04,and the similar Special Structural Inspection-Kit (SSI-K) program starting in FY-05. These programs will allow sustainment of the P-3 fleet until the Multi-mission Maritime Aircraft (MMA) starts replacing the P-3 in 2013.

P-#C Orion ➢

Modernization: The Anti-Surface Warfare Improvement Program (AIP) provides enhanced sensor, C4ISR, and weapon capabilities. The program includes the incorporation of improved C4I systems, an advanced imaging radar, electro-optic sensors, an improved Electronic Support Measures (ESM) system, and improved weapons capability. AIP aircraft will be equipped with the USQ-78B acoustic processor for improved littoral ASW effectiveness.

The P-3C Update III Block Modification Upgrade Program (BMUP) converts P-3C Update II and II.5 aircraft to the Update III system architecture. BMUP aircraft are also equipped with the USQ-78B.

Program Status: 62 AIP aircraft have been funded through April 2005. Eight of 25 BMUP kits have been delivered.

Developer/Manufacturer: SLAP: Lockheed Martin, Marietta,GA; NADEP Jacksonville, FL; Lockheed Martin, Greenville, SC; L3Com, Greenville, TX; Lockheed Martin, Eagan,MN.

S-3B Viking Sustainment Program

Description: The S-3B Viking provides multi-mission support to battle group and joint commanders as the carrier strike group's primary anti-surface warfare platform. In addition, it provides electronic surveillance and overland strike support and will remain the sole organic aerial refueling asset until the full integration of the F-18E/F Super Hornet. Current critical airframe structures initiatives, recent Full Scale Fatigue Test completion, and initial report analysis indicate S-3B fleet aircraft are approaching 50 percent of fatigue life expended and will have adequate catapult/trap structure life to support Viking service beyond 2015 if needed.

Program Status: The S-3B Viking community was selected for retirement in October 2002, which will be coordinated with the fielding of the F/A-18E/F Super Hornet tanker capable aircraft through FY 2009. All current avionics/navigation/computer upgrade programs required to safely sustain the aircraft through its projected retirement schedule have been approved for Full-Rate Production and will be complete in FY 2005.

Funding requirements in FY 2005 and beyond have been reduced to comply with approved retirement schedules and inventories. The majority of Viking pilots and Naval Flight Officers will transition to other Naval Aviation communities as an integral part of the S-3B Sundown Plan.

Developer/Manufacturer: Lockheed Martin, Fort Worth, Texas.

RQ-8B Fire Scout Vertical Takeoff and Landing Tactical UAV (VTUAV)

Description: Fire Scout Vertical Take-off and Landing Tactical UAV will provide multi-mission tactical UAV support to the Littoral Combat Ship (LCS). Fire Scout will support LCS core mission areas of MIW, ASW, and ASUW with modular payloads and weapons as well as organic ISR and comm-relay functions.

The Fire Scout will employ the Tactical Control System (TCS) and the Tactical Common Data Link (TCDL) as the primary means for UAV Command and Control and sensor payload dissemination. Fire Scout is a critical component of the LCS off-board sensors and mission modules required to realize its combat effectiveness.

Program Status: The Fire Scout is currently in Engineering, Manufacturing and Development (EMD) with developmental test ongoing. Fire Scout is scheduled to field with LCS Flight 0 in FY 07 with an OPEVAL in FY 2007 -2008 and IOC in FY 2008. Current plans call for 1 Fire Scout system (3 air vehicles and a GCS) aboard each of the first 11 LCS (Flight 0 & Flight 1).

Developer/Manufacturer: Prime Contractor: Northrop Grumman, San Diego, CA. Airframe production: Schweitzer Aircraft Corporation, New York.

Surface and Expeditionary Warfare Ships

SDTS
Self Defense Test Ship

Description: The ex-USS *Decatur* served as the Self-Defense Test Ship (SDTS) and the primary means for at-sea testing of defensive weapon systems elements. Remotely controlled and unmanned since 1995, the SDTS remains the only means of at-sea testing in a realistic environment. The tests onboard the SDTS are conducted on the Point Mugu test range off the coast of Southern California. Current systems on the SDTS include the Rolling Airframe Missile (RAM), Phalanx Close-In Weapon System (CIWS), Ship Self Defense System (SSDS), Rearchitectured NATO Sea Sparrow Missile System (RNSSMS), and Evolved Sea Sparrow Missile (ESSM).

Program Status: The current SDTS ceased satisfying the requirement for realistic element testing at the end of FY 2003. The Navy conducted our studies that validated the requirement for the SDTS follow-on. To meet this requirement, the Navy has designated the USS *Paul F. Foster* (DD-964) as the SDTS follow-on. The ex-*Decatur* was phased out at the end of FY 2003, and ex-*Paul F. Foster* will IOC as the next SDTS in FY 2005. The conversion will be performed pierside NSWC, Port Hueneme, California.

Developer/Manufacturer: TBD

Weapons

Airborne

AMNS
Airborne Mine Neutralization System

Description: The Airborne Mine Neutralization System (AMNS) is an expendable, remotely operated mine neutralization device that leverages NDI and COTS technologies, deploys from MH-60S helicopters, and provides identification and neutralization of proud (i.e., not buried), close-tethered, and in-volume naval mines. The MH-60S will deploy a remotely operated AMNS neutralization

AMNS ➢

device to a previously detected mine location where it will reacquire and neutralize identified targets. The AMNS will be fully integrated into the MH-60S avionics architecture.

Program Status: Beginning in FY 2003,AMNS systems have been procured for the MH-53E to provide a near-term fleet-interim MCM capability. Follow-on AMNS system integration into the MH-60S began in FY 2003 and will continue through a FY 2007 Milestone C decision. The Navy projects a FY 2007 IOC for the AMNS on the MH-60S.

Developer/Manufacturer: Lockheed Martin, Syracuse, New York; and STN Atlas, Germany.

RAMICS
Rapid Airborne Mine Clearance System

Description: The Rapid Airborne Mine Clearance System (RAMICS) will fire a special 30mm supercavitating projectile from a Bushmaster gun to neutralize surface and near-surface mines. The RAMICS system will ultimately be hosted onboard the MH-60S helicopter as one of five developing Airborne MCM (AMCM) weapon systems organic to the carrier battle group.

At the heart of this system is a supercavitating projectile that is specially designed for traveling tactical distances in air and water and through a casing into the mine,causing a low-order deflagration of the mine. The gun is controlled by a fire-control system with targeting algorithms coupled with a light detection and ranging (LIDAR) system. The LIDAR locates and targets the mines and provides aiming coordinates to the gun's fire control system to fire a burst of rounds at the mine, causing immediate and positive mine neutralization.

Program Status: The RAMICS program awarded an EMD contract in July 2002 and is fully supported in the Navy's FY 2004 budget request. Procurement of systems begins in FY 2006 with first installments in FY 2007. RAMICS IOC is scheduled for FY 2007.

Developer/Manufacturer: ATD: Raytheon Corp, Portsmouth, Rhode Island. EMD: Northrop Grumman.

Subsurface, Surface and Expeditionary

ABS
Assault Breaching Systems

Description: The assault breaching program focuses on development of standoff weapons systems to counter mine and obstacle threats in the surf and beach zones. The program uses a "System of Systems" approach that includes development and fielding of Counter Mine Counter Obstacle (CMCO) kill mechanisms, Intelligence/Surveillance/Reconnaissance and Targeting (ISR/T), Precision Craft Navigation, Lane Marking and C4I capabilities. Near-term capability to be fielded in FY06 with a far-term capability by FY14 (IOC) - FY16 (FOC). Potential platforms for employment of the breaching (kill) mechanisms may be naval strike aircraft, Air Force combat aircraft, or naval surface fire ships.

Program Status: Program funded. Navy decision funds "System of Systems" approach - $161M over FYDP.

Developer/Manufacturer: To be determined.

Aerial Targets

Description: The Navy Aerial Target Program assesses foreign threats, develops new targets to replicate the threats, and procures targets for fleet training and weapon system test and evaluation. The current inventory includes drones that replicate the following types of threats: high-altitude supersonic diving missiles (AQM-37), aircraft (QF-4), subsonic sea-skimming anti-ship cruise missiles (BQM-34/74), and supersonic sea-skimming cruise missiles (MQM-8G ER/EER Vandal, MA-31). New efforts within the program include the development and procurement of a next- generation Supersonic Sea-Skimming Target (SSST), the GQM-163, designed to validate fleet readiness and weapon system effectiveness against a family of supersonic anti-ship cruise missiles. In addition, the Navy is conducting a Pre-Planned Product Improvement on the primary subsonic aerial target, the BQM-74E. The follow-on to the BQM-74E, the BQM-74F will be a smaller, faster subsonic aerial target to challenge weapons systems and better train sailors.

Program Status: The GQM-163A developmental contract was awarded in June 2000 to Orbital Sciences, with first delivery expected in FY 2005 as a replacement to the Vandal and MA-31 SSSTs.BQM-74F targets will enter the Fleet in FY 2007. The Navy is also evaluating the potential of incorporating totally autonomous pre-planned flight profiles for the BQM-74, which would reduce the need for target control stations as well as enabling the target to fly in areas where target control is not available. The Navy is in the process of discontinuing the Navy QF-4 program, and continued testing will be accomplished by Navy crews on Air Force ranges against QF-4s procured from the Air Force.

Developer/Manufacturer: Raytheon built the AQM-37. Northrop Grumman (Rancho Bernardo, California) builds the BQM-74E/F. Boeing Company (St. Louis, Missouri) is the prime contractor for MA-31. Orbital Sciences (Chandler, Arizona) is developing and building the GQM-163A.

Stabilized 25-mm Chain Gun

Description: This upgrades the current Mk 38 25mm chain gun with stabilization, remote operation, fire control, and EO sensor. The program fills the surface self-defense capability gap for ships that are not CIWS BLK 1B configured, and is designed to engage real-time asymmetric threats at close-range to ships in port, at anchor, or while transiting choke points or operating in restricted waters. It provides the capability to bridge current and future targeting and weapons technology in a close range Force Protection environment. Furthermore, a future incremental upgrade to IROS3 will include remote controlled stabilized guns as a primary lethal engagement portion of the detect-to-engage sequence.

The ability to remotely control a minor caliber weapon and the accuracy benefits of stabilization greatly enhance the ship's ability

Stabilized 25-mm Chain Gun ➢

to protect itself from small boats, combat swimmers, and asymmetric threats. Stabilized 25-mm Chain Gun is a good complement to CIWS BLK 1B due to its accuracy and ability to minimize collateral damage in port. Very effective in U.S. Navy ships against a USS *Cole*-type attack while ships are in port, anchored, or transiting choke points or restricted waters.

Program Status: PB05 Budget funds 91 stabilized mounts, which will be fielded on all ship classes to fill the gap until CIWS BLK 1B can be fully fielded.

Developer/Manufacturer: Contract is currently in the competitive final source selection stage.

Mk 15 CIWS
Phalanx Close-In Weapon System

Description: The Mk 15 Phalanx Close-In Weapon System (CIWS) is a radar-controlled, rapid-fire gun capable of firing 4,500 rounds per minute. An integral element of ship self-defense and the anti-air warfare, defense-in-depth concept, CIWS provides terminal defense against anti-ship cruise missiles (ASCMs) and high-speed aircraft penetrating outer fleet defensive envelopes. Additionally, CIWS Block 1B Surface Mode (PSuM) provides defense against small,fast, surface craft and slow-flying helicopters and aircraft. Other Block 1B improvements include better sensor support for close-in engagements [FLIR/Video Tracker/Enhanced Radar (Ku Band)], the Enhanced Lethality Cartridge (ELC), and Optimized Gun Barrels (OGB). Existing CIWS mounts (Block 1 Baseline 0 through 2 and Block 1A) are being upgraded to CIWS Block 1B, outfitting all deploying ships by FY 2010 and completing installation by FY 2012. CIWS 1B upgrades and new production is programmed for aircraft carrier, cruiser, destroyer, frigate, and amphibious warships (LHD, LHA, and LPD) classes.

Program Status: More than 400 CIWS systems have been deployed at sea on U.S. warships since the system was first tested in August 1973. Development and Operational Testing of the HOLC fire-control system completed in FY 1996, using the Self-Defense Test Ship. Testing of the Phalanx Surface Mode capability was completed in FY 1998,again using the Self-Defense Test Ship, and initial delivery was made in FY 2000. Acquisition continues in sufficient numbers to support new-construction warship delivery. In FY 2005 19 CIWS 1B will be procured, and 76 CIWS 1B are scheduled for the out-years (FY 2006-2010).

Developer/Manufacturer: Raytheon, Tucson, Arizona.

Mk 48 ADCAP Torpedo
Advanced Capability Heavyweight Torpedo

Description: All U.S. attack and ballistic missile submarines (SSN and SSBNs) carry the Mk 48 torpedo. The improved Mk 48 ADCAP is carried by the *Seawolf* (SSN-21)-class, *Los Angeles* (SSN-688)-class, and *Ohio* (SSBN-726)-class submarines; it will also arm the *Virginia* (SSN-774)-class attack submarines. The Mk 48 ADCAP's upgraded guidance and propulsion systems enable U.S. submarines to attack hostile surface ships or submarines in the presence of torpedo countermeasures and in adverse environmental conditions, including shallow water. A modification to the ADCAP (ADCAP

MOD) increases guidance and control speed and memory, significantly reduces radiated noise, and improves the torpedo's performance against all threats in all operational environments, including deep-diving nuclear submarines, high-performance surface ships, and diesel-electric/advanced air-independent submarines (SSK) in the littoral environment. Both variants can operate with or without wire guidance using active and/or passive homing and can execute preprogrammed search and attack procedures. A follow-on hardware upgrade, known as Common Broadband Advanced Sonar System (CBASS), began development in FY 1998. CBASS will further enhance the torpedo's performance against modern and evolving SSNs and SSKs employing advanced countermeasures.

Program Status: ADCAP MOD upgrade production began in FY 1995. An additional 90 torpedoes were upgraded in FY 2003. CBASS begins LRIP in 2004 and full rate production in 2006. In FY 2004, 76 modifications were made, with 15 CBASS modifications. In FY 2005, 78 modifications are planned with 15 CBASS modifications, with an additional 483 CBASS modifications for FY 2006-2009.

Developer/Manufacturer: Raytheon, Integrated Defense Systems, Keyport, Washington.

Mk 54 LHT
Lightweight Hybrid Torpedo

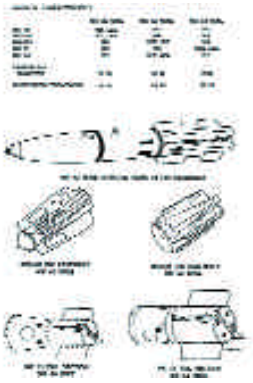
Description: The Mk 54 Lightweight Hybrid Torpedo is a modular upgrade to the lightweight torpedo inventory and is designed to counter quiet diesel-electric submarines operating in the shallow water littoral environment. LHT combines existing torpedo hardware and software from the Mk 46, Mk 50, and Mk 48 Advanced Capability (ADCAP) programs with advanced digital COTS electronics. The resulting Mk 54 LHT offers significantly improved shallow water counter-countermeasures capability at reduced life-cycle costs.

While the baseline Mk 54 will provide the warfighter with improved shallow water performance, the MK 54 P3 will modernize the MK 54 by taking continuous advantage of technology advancements during the hardware acquisition process while addressing current weapon limitations and evolving threats and countermeasures.

The Mk 54 modernization plan will leverage the spiral acquisition process to synergistically introduce new hardware and software updates that will provide step-like increases in probability of kill while reducing life-cycle cost and allowing the torpedo to remain ahead of the evolving littoral submarine threat.

Program Status: MS II was achieved in FY 1996 along with an EMD contract award. A successful CDR was held in November 1999 with developmental testing beginning in July 1999. The LRIP contract was awarded in early FY 2000. The Mk 54 Program has recently completed OPEVAL and is proceeding to Milestone III in 4th quarter FY 2004, with fleet introduction scheduled for FY 2005. Procurement will include 94 LHT in FY 2005, and 1,000 for the total program. The torpedoes will be procured in economic order quantities from FY 2006 through FY 2011 to achieve a fleet operational capability in FY 2011.

Developer/Manufacturer: Raytheon, Mukilteo, Washington.



Naval Mines
Quickstrike Mines

Description: The current Quickstrike family of aircraft-delivered bottom mines will be enhanced significantly by procurement of the programmable Target Detection Device (TDD) Mk 71. Engineering development efforts include new advanced algorithms for ship detection, classification, and localization against likely threats, including quiet diesel-electric submarines, mini-subs,fast patrol boats, and air-cushioned vehicles.

Program Status: In-service support continues for current inventories and funding is in place for algorithm development and procurement the TDD Mk 71. In September 2002 the Navy awarded the contract to begin procuring the TDD Mk 71.

Developer/Manufacturer: SECHAN Electronics, Inc., Lititz, Pennsylvania.

2010 Mine

Description: The 2010 Mine is a follow-on weapon to replace the in-service Mk 56 Mine, an aircraft-delivered medium-depth mine primarily designed for Cold War-era Soviet threats. The 2010 Mine will be optimized to be effective against high-priority threats in the littoral, including slow/quiet submarines, fast patrol craft, and air-cushion vehicles. The 2010 Mine is intended primarily for aircraft delivery but will have provisions for submarine and surface launch.

Program Status: A three-year Navy laboratory/industry advanced-technology demonstration program sponsored by the Office of Naval Research (ONR) completed in 2003. The effort explored technologies applicable to medium-depth mining, including: multi-influence (acoustic,magnetic, pressure,seismic) sensing and data fusion, standoff wireless mine and mobile warhead control, and cooperative minefields and mobile warhead concept evaluation. An analysis of alternatives commenced in FY 2003 and engineering development is planned in FY 2005. The Navy has planned IOC for FY 2010.

Developer/Manufacturer: To be determined

Navy BMD
Aegis Ballistic Missile Defense

Description: Aegis BMD includes modifications to the Aegis Weapon System and the integration of the Standard Missile 3 (SM-3) with its hit-to-kill kinetic warhead. This combination will give a number of Aegis cruisers and destroyers the capability of intercepting short- and medium-range ballistic missiles in the ascent, midcourse, and descent phases of their exo-atmospheric trajectories. Additionally, Aegis BMD will provide surveillance and tracking capability against long-range ballistic missiles. Together, these capabilities will provide robust defense-in-depth to U.S. and allied forces, vital political and military assets, population centers, and large geographic regions against the threat of ballistic missile attack. The block developmental approach will lead to the introduction the Aegis BMD long range surveillance and tracking capability as an element of the Ballistic Missile

Defense System (BMDS) in 2004, followed by a short and medium range ballistic missile engagement capability in 2005. The Aegis BMD Program Office continues a two-pronged engineering development effort of supporting SM-3 test flights and participating in risk-reduction activities.

Program Status: Based on successful flight tests in 2002, the Missile Defense Agency transitioned the Aegis BMD flight test program into the next phase of more difficult scenarios and against more sophisticated targets. The Aegis BMD Program conducted the first two of these more strenuous flight tests in June and December 2003. The Aegis BMD Program Office is on track to introduce the Aegis BMD short-and medium-range engagement capability in 2005. By demonstrating the abililty to track long-range ballistic missiles, the Aegis fleet has paved the way for the Navy to play a central role in the nation's Ballistic Missile Defense System (BMDS) in 2004. In July and August 2003, the USS *Lake Erie* (CG-70) conducted a series of connectivity tests in the Western Pacific that demonstrated the key contribution of Aegis to this capability.

Developer/Manufacturer: Lockheed Martin, Moorestown, New Jersey; Raytheon, Tucson, Arizona.

RIM-7 NSSMS and RIM-162 ESSM
Sea Sparrow Missile and Evolved Sea Sparrow Missile

Description: The Mk 57 NATO Sea Sparrow Missile System (NSSMS) is deployed on more than 50 U.S. Navy ships (CVN, LHD, LHA,DD, AOE classes) and numerous NATO ships as their primary surface-to-air ship self-defense missile system. Modifications to the Sea Sparrow continue, including the re-architecture combat system upgrade for CVNs, which reduces maintenance and manpower requirements, increases firepower, integrates the Evolved Sea Sparrow Missile (ESSM), and reduces cost of ownership through the use of COTS components.

ESSM is the next generation of Sea Sparrow missiles, selected for the *Arleigh Burke* (DDG-51) Flight IIA Aegis destroyer self-defense system as well as for Aegis cruisers following Cruiser Modernization, aircraft carriers and amphibious assault ships. ESSM is a kinematic upgrade to the improved RIM-7P missile; the existing rocket motor and control section are replaced with a larger-diameter rocket motor, a tail control section for increased responsiveness, and an integrated thrust vector control for vertical launch applications. ESSM will also have an upgraded warhead and a quick-start electronic upgrade. Enhanced ESSM kinematic performance and warhead lethality will leverage the robust RIM-7P guidance capability to provide increased operational effectiveness against high-speed maneuvering anti-ship cruise missiles at greater intercept ranges than is now possible with the RIM-7P. ESSM will be incorporated into the Aegis Baseline 6 Phase III and Baseline 7 Weapon Systems for short- to medium-range missile defense. Additionally, the Mark 29 trainable guided missle launcher will be modified to launch ESSM on the CVN and LHD classes. ESSM development is being pursued as an international cooperative initiative involving ten countries in the NATO Sea Sparrow Consortium.

RIM-7 NSSMA and RIM-162 ESSM ➢

Program Status: In-service support of NATO Sea Sparrow systems is complete. A Memorandum of Understanding was signed in June 1995, and 12 countries (Australia, Belgium, Canada, Denmark, Germany, Greece, Netherlands, Norway, Portugal, Spain, Turkey, and the United States) signed a Production MOU for the ESSM in December 1997. ESSM successfully completed Operational Evaluation testing in mid-2003 and received approval for entry into Milestone III in January 2004. IOC occured in FY 2004 with fleet introduction on an *Arleigh Burke* Flight IIA destroyer.

Developer/Manufacturer: Raytheon, Tucson, Arizona.

RIM-66C SM-2
Standard Missile-2 Blocks III/IIIA/IIIB

Description: The Standard Missile-2 (SM-2) is the Navy's primary surface-to-air theater air warfare weapon. Deployed SM-2 Block III/IIIA/IIIB configurations are all-weather, ship-launched, medium-range surface-to-air missiles in service with the U.S. Navy and several allies. A robust area air defense missile is a prerequisite for maintaining forward naval presence, operating in the littorals, and projecting and sustaining U.S. forces in distant anti-access or area-denial environments. Each of the blocks is progressively more capable against more challenging threats and in more difficult electronic countermeasures (ECM) environments. The SM-2 is launched from the Mk 41 Vertical Launching System (VLS) found on Baseline 2 Aegis cruisers (CG-52) and above and all Aegis guided-missile destroyers. It employs inertial mid-course guidance with command updates from the shipboard fire control system and an ECM-resistant monopulse receiver for semi-active radar terminal homing.

The SM-2 continues to evolve to counter expanding threat capabilities;the Navy continues to implement modular improvements in very high- and very low-altitude intercepts and in particularly stressing ECM environments. Block III features improved performance against low-altitude threats and more fully uses the trajectory shaping resident within command guidance from the Aegis weapons system by implementing Trajectory Shaping and Fuse Altimeter engineering change improvements. Block III comprises more than half of the active SM-2 inventory.

Block IIIA features significantly enhanced performance and lethality against sea-skimming threats due to a new directional warhead and MovingTarget Indicator (MTI) fuse design in addition to enhanced trajectory-shaping functionality. Block IIIB builds on the Block IIIA improvements by adding an infrared (IR) guidance mode capability developed in the Missile Homing Improvement Program (MHIP) to improve performance in a stressing electronic countermeasures environment. The IIIB MHIP dual-mode RF/IR guidance capability is being incorporated to counter a specific fielded and proliferating electronic warfare system in existing aircraft and cruise missile threats. Blocks IIIA/IIIB will be the heart of the SM inventory for the next 15 years. Additional improvements are underway to enhance IIIB performance against the latest threats, but these improvements

are low-cost and of a magnitude not requiring a block upgrade. The Block IIIB enhanced capabilities improve performance against low-altitude, supersonic maneuvering threats in high clutter and adverse environmental conditions, including electronic attack environments.

Program Status: SM-2 Block III/IIIA/IIIB missiles are currently deployed. Block IIIB is the only variant in production for the U.S. Navy, although Block IIIA is still produced for Foreign Military Sales. Block IIIBs are being produced as new all-up rounds and as upgrades from older Block III missiles.FY 1995 was the first year of production for the SM-2 Block IIIB, which achieved IOC in FY 1997. The resource-constrained procurement plan is limited to 1,500 Block IIIB AUR and 1,100 upgrades, and procurement is scheduled to end in FY 2015. Block IIIB Enhanced Capability goes into production in FY 2006.

Developer/Manufacturer: Raytheon, Tucson, Arizona.

RIM-116A RAM Rolling Airframe Missile

Description: RAM is a high-firepower, low-cost system designed to engage anti-ship cruise missiles (ASCMs) in the stressing electronic countermeasures (ECM) littoral conflict environment. RAM is a five-inch diameter surface-to-air missile with passive dual-mode radio frequency/infrared (RF/IR) guidance and an active-optical proximity and contact fuse. RAM has minimal shipboard control systems and does not require shipboard information after launch. Effective against a wide spectrum of existing threats, the RAM Block 1 IR upgrade incorporates IR "all-the-way-homing" to improve performance against evolving passive and active ASCMs.

Program Status: RAM is installed in all five *Tarawa* (LHA-1)-class amphibious assault ships; seven *Wasp* (LHD-1)-class amphibious assault ships; six *Spruance* (DD-963)-class destroyers; eight *Whidbey Island* (LSD-41)-class dock landing ships; four *Harpers Ferry* (LSD-49)-class dock landing ships, and seven aircraft carriers; RAM is also planned for installation on all remaining aircraft carriers by FY 2007 as well as for all *San Antonio* (LPD-17)-class landing platform dock ships. Block 0 missiles and launchers completed their final production run on schedule, and the missile has had successful intercepts in 177 of 186 production-acceptance and ship-qualification tests. The Block 1 missile has completed the most stressing OPEVAL ever attempted using the Self-Defense Test Ship—23 of 24 successful firings—and has completed Developmental/Operational Testing, with IOC in FY 2000. Block 1 is currently at Full Rate Production. So far the program has procured 90 missiles in FY 2002,106 in FY 2003, 90 in FY 2004, with an additional 90 in FY 2005 and 360 missiles from FY 2006-2009,leaving 1,100 missiles to be procured outside the FYDP.

Developer/Manufacturer: Raytheon, Tucson, Arizona; and RAMSYS,Germany.

SM-6 ERAM
Extended-Range Active Missile Block I/II

Description: Under Secretary of Defense (USD), Acquisition, Technology & Logistics (AT&L) cancelled the Navy Area Theater Ballistic Missile Defense (TBMD) Program on 14 December 2001, which resulted in the termination of the development of the SM-2 Block IVA missile (see the 2003 VPP edition, page 88, for a summary of the terminated Block IVA missile). The SM-2 Block IVA missile was intended for both Area TBMD and extended-range anti-air warfare (AAW) mission areas. USD(AT&L) directed the Secretary of the Navy to address the need for extended-range AAW capability against cruise missiles and aircraft in light of this cancellation and report course of action. The Assistant Secretary of the Navy for Research, Development & Acquisition (ASN RDA) responded to USD(AT&L) direction and provided the U.S. Navy AAW extended-range capability development plan for ERAM.

The SM-6 with its active-seeker technology will meet the anticipated theater air and missile warfare threat in 2020, providing an essential element of the Navy's Sea Shield concept. Introduction of active-seeker technology to AAW in the Surface Navy reduces Aegis Weapon System reliance on illuminators and provides improved performance against stream raids and targets employing advanced characteristics (maneuverability, radar cross section,kinematics,and advanced ECM features).ERAM deliveries could begin in time to help negate significant SM-2 out-year inventory shortfall as older variants (SM-2 Block III/IIIA) become overage and are removed from service. The SM-6 is a critical pillar of the Navy's Integrated Fire Control-Counter Air (NIFC-CA) capability and contribution to the joint Integrated Fire Control operational architecture.

The evolutionary strategy will leverage the alignment of technology paths of the Naval Sea Systems Command (NAVSEA), the Naval Air Systems Command (NAVAIR),and the Air Force across multiple missions and missile production lines to dramatically reduce technology development recurring production and life cycle costs across the services. This ERAM acquisition strategy is characterized as a low-risk development approach, which leverages the SM-2 Block IV/IVA program Non-Developmental Items and Raytheon's Advanced Medium Range Air-to-Air Missile (AMRAAM) Phase 3 active seeker program for NAVAIR.

The SM-6 need is documented in the Mission Need Statement for Joint Theater Air and Missile Defense, and was approved by the Joint Requirements Oversight Council (JROC) on 7 July 1999. The overall mission requirement is documented in the TAMD Capstone Requirements Document, dated 1 March 2001, and in the Ship Class Anti-Air Warfare Self-Defense CRD, dated November 1995. The specific ERAM requirements are documented in the Operational Requirements Document for Extended-Range Active Missile,signed by the CNO on 1 May 2004. The SM-6 missile will be fielded on legacy DDG-51 and CG-47 class ships as well as the future DD(X) and CG(X) family of warships.

Program Status: The SM-6 is an ACAT ID program that is planned to achieve Milestone B in the second quarter FY 2004. Due to JTAMDO requirements for a Block I IOC in FY 2010,SM-6 SD&D will be a sole-source contract awarded to Raytheon. The Class Justification and Approval (J&A) for sole source was approved by ASN (RDA) on 14 April 2004. Spiral development for Block II will achieve full Joint Integrated Fire Control engagement operations and could include expanded capabilities to support seabased terminal ballistic missile defense.

Developer/Manufacturer: Raytheon, Tucson, Arizona.

UGM-133A Trident II/D5 SLBM
Submarine-Launched Ballistic Missile

Description: The Trident II/D5 is the sixth generation of the U.S. Navy's Fleet Ballistic Missile (FBM) program, which started in 1955. The D5 is a three-stage, solid propellant, inertial-guided submarine-launched ballistic missile (SLBM) with a range greater than 4,000 nautical miles and accuracy measured in hundreds of feet. The first eight *Ohio*-class ships were configured to carry 24 Trident I/C4 submarine-launched ballistic missiles (SLBMs). The ninth ship, the USS *Tennessee* (SSBN-734) and all later ships were armed with the Trident II/D5 missile system. Conversion of four of the C4 ships to carry the Trident II/D5 missile began in FY 2000 and will be completed in FY 2008. Trident missiles are capable of carrying W76 or W88 Multiple Independently Targeted Reentry Vehicles (MIRVs). In operation Trident II/D5 missiles have been declared at eight MIRV warheads while Pacific Fleet Trident I/C4 missiles have been declared at six under the Strategic Arms Reduction Treaty (START).

The Navy continues to address future deterrence requirements against weapons of mass destruction and disruption, and the Trident II/D5 will ensure that the United States has a modern, survivable strategic deterrent.

Program Status: FY 2005 funding will be dedicated to the D5E life extension program. Twelve missiles will be acquired in FY 2008 and 24 in FY 2009,leaving 79 for completion outside the FYDP.

Developer/Manufacturer: Lockheed Martin, Sunnyvale, California.

Sensors

Airborne

AAR-47 MAWS
Missile Approach Warning System

Description: Employed on helicopters and transport aircraft across U.S. Armed Services, the AAR-47 Missile Approach Warning System warns of threat missile approach by detecting radiation associated with the rocket motor and automatically initiates flare ejection. The AAR-47 is a passive, missile-approach warning system consisting of four sensor assemblies housed in two or more sensor domes, a central processing unit, and a control indicator. The Warning System provides attacking missile

AAR-47 MAWS ➢

declaration and sector direction finding and will be interfaced directly to the ALE-39/47 countermeasures dispenser. The AAR-47(V)2 upgrade which is in full rate production will improve missile warning performance, add laser warning functionality, and reduce operations and support costs of existing AAR-47 systems. Without the AAR-47, helicopters and fixed-wing aircraft have no infrared missile detection system.

Program Status: AAR-47(V)2 is currently in early full rate production. Work has begun on an advanced two-color IR Missile Warning Sensor and laser-based countermeasure, which were demonstrated by the Tactical Aircraft Directed Infra-Red Counter-Measure (TADIRCM) Advanced Technology Demonstration (ATD). This revolutionary technology will be fielded in a future version of AAR-47. The Navy plans to buy one AAR-47(V)2 for every new assault support aircraft in the FYDP (MV-22,UH-1Y, AH-1W, KC-130J etc) and plans to buy 82 retrofit kits for legacy platforms in FY 2005. The procurement objective for retrofit kits is 1090.

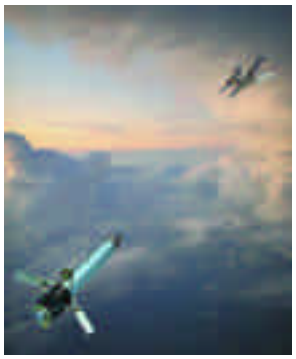
Developer/Manufacturer: Alliant Defense Electronic Systems, Clearwater, Florida.

ALR-67(V)3
Advanced Special Receiver

Description: The AN/ALR-67(V)3 is a radar warning receiver (RWR) designed to meet Navy requirements through the year 2020. It will enable Navy F/A-18E/F aircraft to detect threat radar emissions, enhancing aircrew situational awareness and aircraft survivability.

Program Status: The ALR-67(V)3 program successfully completed EMD phase and operational testing in 1999 and is in Full-Rate Production. Production quantities will eventually outfit all F/A-18E/F aircraft. The Navy has 42 systems funded for procurement in PB 2005.

Developer/Manufacturer: Raytheon, Goleta, California.



IDECM
Integrated Defensive Electronic Counter-Measures

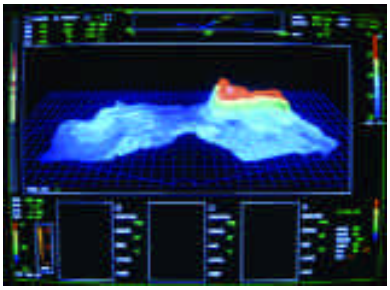
Description: Employed on the F/A-18E/F, the ALQ-214 Radar Jammer is used to defend the host aircraft against radar-guided surface-to-air missile (SAM) systems. Either through a towed decoy or through several onboard transmitters,the ALQ-214 produces complex waveform radar jamming that defeats even advanced SAM systems.

Program Status: The ALQ-214 and ALE-50 (towed decoy) combination are currently in full rate production. The ALE-55 Fiber Optic Towed Decoy is currently in Developmental Test and is scheduled to begin Operational Test in FY 2006.

Developer: BAE systems, Nashua, New Hampshire.

Subsurface

BQQ-10 ARCI
Acoustic Rapid COTS Insertion



Description: Acoustic Rapid COTS Insertion is a three-phase program that replaces existing legacy submarine sonar systems, including BQQ-5 (SSN-688), BSY-1 (SSN-688I), BSY-2 (SSN-21), and BQQ-6 (SSBN-726) sonars, with a more capable and flexible COTS-based Open Systems Architecture (OSA),and provides the submarine force with a common sonar system. It allows development and use of complex algorithms that were previously well beyond the capability of legacy processors. The use of COTS/OSA technologies and systems will enable frequent periodic updates to both software and hardware with little or no impact on submarine scheduling. COTS-based processors allow computer power growth at nearly the same rate as commercial industry. A key facet of the sonar ARCI program (now designated AN/BQQ-10) includes the Submarine Precision Underwater Mapping and Navigation (PUMA) upgrade. This consists of software processing improvements delivered as part of Advanced Processor Build (APB) 02, to the AN/BQQ-10 High Frequency (HF, A-RCI Phase IV) and AN/BQS-15 EC-19 sonar systems. This enhancement provides submarines with the capability to map the ocean floor and register geographic features,including mine-like detections, and display the map in a 3-D representation. This capability to precisely map the ocean floor allows submarines to conduct covert battlespace preparation of the sea bottom as well as minefield surveillance and avoidance, with impunity. These digital maps can be compressed and transmitted to other naval forces for display on seabased and land-based platforms. Additionally, the open architecture design of the ARCI system allows for the rapid inclusion of advances in sensor systems and processing techniques at minimal cost. New sensor systems, such as the low cost conformal array, large vertical array, and advanced towed arrays currently in development, will be incorporated in the ARCI system through annual advanced processor build (APB) software improvements.

Program Status: ARCI Phase II (FY 1999) provided substantial towed and hull array software and hardware processing upgrades that significantly improved LF detection capability. Phase III (FY 2001) augments the current Spherical Array DIMUS beamformer with a linear beamformer and enhanced processing that improves MF detection capability. Phase IV (FY 2001) upgrades the HF sonar on late-generation, Improved *Los Angeles*-class submarines (SSN-688I). Each phase installs improved processing and workstations (point click trackballs, Windows environment). Recent, real world encounters have consistently demonstrated overwhelming success of this program to restore U.S. acoustic superiority. A-RCI completed OPEVAL in FY 2003. The BQQ-10 sonar system is being installed as rapidly as possible given the available funding.

Additional funding will accelerate vital improvements to towed array processing in support of fleet operations, accelerated delivery of organic mine countermeasures (MCM) capability inherent

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BQQ-10 ARCI ➢

in A-RCI Phase IV and PUMA, and completing Phase III upgrades for all submarines.

Navy research, development, test,and evaluation will continue to develop processing algorithms from the surveillance, tactical and advanced R&D communities as well as perform laboratory and at-sea testing, and distribute upgrades periodically.

Developer/Manufacturer: Lockheed Martin, Manassas, Virginia; Digital Systems Resources, Inc., Fairfax, Virginia; and Advanced Research Laboratory, University of Texas at Austin.

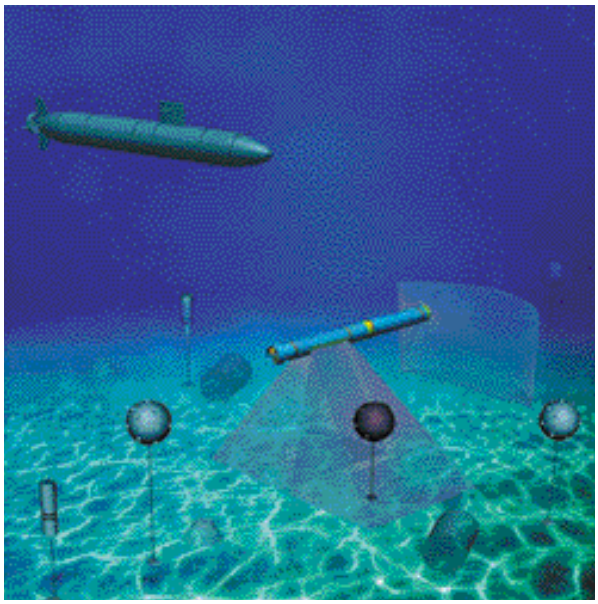
TB-29A
Submarine Thin-line Towed Array

Description: The TB-29A submarine thin-line towed array is a COTS version of the legacy TB-29 towed array. These arrays will be used for backfit on *Los Angeles* (SSN-688 & SSN 688I) and *Seawolf* (SSN-21) submarines and will be forward-fit on the *Virginia* (SSN-774) class submarine.TB-29A will also be used for the SURTASS Twin-line towed array system. It will provide greater capability than the current TB-23 thin-line towed arrays and achieve enhanced supportability through commonality. The TB-29A uses COTS telemetry to reduce significantly unit cost while maintaining superior array performance. These arrays were tested on the SURTASS ships and will begin supporting the IUSS community in FY 2004. Coupled with the submarine A-RCI system, TB-29A arrays are expected to provide the same 400-500 percent increase in detection capability against quiet submerged platforms in blue water and shallow water areas, as the current TB-29 has demonstrated.

Performance Status: Favorable TECHEVAL and OPEVAL results show the TB-29A performance as superior to the TB-29, giving the *Virginia* class and the A-RCI equipped SSNs a better performing tactical towed array. OPEVAL was conducted during the second quarter of FY 2003. The official report is due out in mid-FY 2004.A total of eight arrays have been procured and delivered under LRIP I & II. There were three arrays remaining to be delivered under LRIP II, with delivery dates during early FY 2004. Twelve arrays were procured under LRIP III with deliveries scheduled to begin in the third quarter of FY 2004. Procurement rates to date have been based upon the availability of limited funding. As a result,in FY 2003 the program sponsor determined that there were insufficient funds to support production and procurement of TB-29A arrays beyond FY 2004. These shortfalls in funding, coupled with changes in fleet requirements, led to the recommendation to cancel the program. Therefore, during the first quarter of FY 2004 the MDA granted permission to closeout this ACAT Level III program with a final LRIP buy consisting of nine additional arrays. Expected delivery of the final LRIP arrays will be in FY 2005. The total procurement of TB-29A arrays upon completion and delivery of the final LRIP buy will be 32.

Developer/Manufacturer: Lockheed Martin, Syracuse, New York, and L3 Communications, Sylmar, California.

UUVs
Unmanned Undersea Vehicles

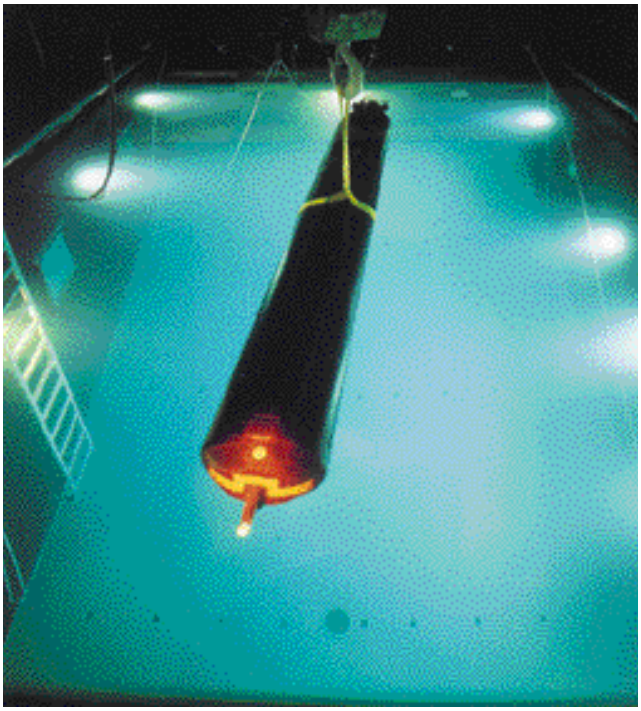


Description: Several acquisition programs are ongoing within the Navy to field unmanned undersea vehicle (UUV) systems to improve current Navy Sea Shield capabilities in enabling assured access. The Navy's UUV plan highlights rapid development and deployment of a clandestine mine-reconnaissance capability. The Long-Term Mine Reconnaissance System (LMRS)—in development and scheduled to enter service in FY 2006—will provide a robust, long-term capability to conduct clandestine minefield reconnaissance. The LMRS will include many significantly improved capabilities, including submarine launch and recovery as well as an autonomous operation endurance of more than 40 hours. Pre-Planned Product Improvement (P3I) enhancements are being pursued to expand LMRS capabilities in the areas of Precision Underwater Mapping and Navigation, Synthetic Aperture Sonar, Acoustic Communications, and high-density renewable energy sources.

The Mission Reconfigurable UUV (MRUUV) began development in FY 2004. An outgrowth of the LMRS program,the initial 21-inch MRUUV will be of similar size and shape as the LMRS and will build upon the LMRS design by sharing certain components and support systems. MRUUV represents an enhanced capability by providing "plug-and-fight" sensor packages for potential missions such as Intelligence/Surveillance/ Reconnaissance (electro-magnetic and electro-optical ISR, and Indications and Warning), Undersea Search and Survey, Communications and Navigation aids, remote ASW tracking, and monitoring for weapons of mass destruction. A Large Displacement MRUUV will be developed as a follow-on to the 21-inch MRUUV and will bring enhancements in endurance and sensor packages.

Several small UUVs are being developed as force multipliers by Very Shallow (VSW) Mine Countermeasures, Explosive Ordnance Disposal (EOD) forces, and Surface Mine Countermeasure (SMCM) forces. This will enable traditional unexploded ordnance (UXO) response forces (e.g., divers and other mine- hunting assets) to improve operational mission effectiveness, reduce the risks of human and marine mammals exposure to dangerous environments, and allow increased operational abilities in extreme environments such as areas of high current and low visibility. Naval Special Clearance Team ONE (NSCT-1) VSW UUVs are designed for deployment from small craft and will enable rapid search, classify, and mapping tactical operations in the VSW zone between 10 and 40 feet of sea water near hostile shores.

The EOD UUVs will be used for searching for and localizing UXO hazards including mines, submerged munitions, and weapons of mass destruction, as well as conducting ship hull searches in support of Force Protection and other fleet requirements. Dedicated SMCM UUVs are being designed to complement existing surface MCM systems and aid in reducing platform risk and improving the overall tactical timeline for MCM operations. The dedicated SMCM UUV program is the first step in moving from onboard sensors to multiple off board sensors.



Program Status: The LMRS completed detail design in August 1999 and is in the EMD Phase. The SAHRV program recently completed Operational Evaluation, and an initial operational capability for the VSW MCM Detachment S-C-M UUV system is programmed for FY 2005. As the Navy's Small UUV Strategic Plan requires, the EOD and NSCT-1 programs are already on accelerated schedules. NSCT 1 and EOD UUV interim systems have been fielded and involved in real world operations. EOD UUVs were used in support of Columbia Space Shuttle underwater search and recovery operations. During Operation Iraqi Freedom,NSCT-1 UUVs were deployed in the port of Umm Qasr, successfully operating in strong currents and low visibility; they validated the significant operational value added to fleet operations. The use of these UUVs reduced the tactical timeline, minimized risk to man-in-the-minefield systems and improved overall mission effectiveness. UUV systems employed during these operations were user operational evaluation systems (UOES) that were procured via sole-source contracts to provide a preliminary operational capability or were procured through Defense Emergency Response Funding (DERF) in response to rapidly emerging needs identified post-9/11. An initial operational capability (IOC) for the VSW UUV will be achieved in FY 2005 and the EOD UUV in FY 2008-2009. The SMCM UUV program began in FY 2004, with a two-year demonstration initiative to evaluate operating UUVs from SMCM platforms. Upon completion of the demonstration period, the Navy anticipates a formal acquisition program will be initiated. The FY 2005 request includes funding for development of LMRS, MRUUV, and LDUUV, and procurement of two LMRS. Program of record calls for procurement of a total of 12 LMRS by FY10.

Developer/Manufacturer: LMRS: Boeing, Anaheim, California. SAHRV: Woods Hole Oceanographic Institution.

Surface and Expeditionary

AADC
Area Air Defense Commander

Description: The AADC Capability provides a maritime and shore-based operational-level planning and execution tool for air defense operations under the Joint Theater Air and Missile Defense (JTAMD) concept. In the early stage of a contingency, the preponderance of forces will likely be seabased. Aircraft carrier strike groups will act as the hub of rapidly expanding joint force structure. A maritime-based or strategically located ashore AADC Capability provides the tools necessary to plan and conduct operations in support of air defense throughout the spectrum of conflict. Current and future JTAMD operations require an advanced common Battle Management/Command, Control, Communications, Computers, Intelligence (BMC4I) architecture. This includes a Single Integrated Air Picture (SIAP) and the capability for centralized planning and decentralized execution. The AADC Capability will permit rapid re-planning and course of action evaluations. With the AADC capability, more of the Air Defense Planner's effort can be spent on analysis instead

of data collection and input. The system employs a "six degrees of freedom" modeling capability to optimize force laydown and employment to achieve the desired level of protection. Situational awareness is provided by a three-dimensional tactical operations display system. The 3-D capability provides the ability to view the battlespace from any direction or altitude. This display capability provides a common picture through fusion of all available tactical data links and sensor information into an easily understood picture that enables the AADC to exercise command by exception. The AADC capability consists of a suite of high-performance computers and displays employing advanced software on a series of state-of-the-art processors. The AADC Capability also provides a distributed collaborative planning feature that permits the AADC staff to interact rapidly with counterparts in other staffs.

Program Status: There are five fielded units, plus one at the General Dynamics Advanced Information Systems (GDAIS) facility in Greensboro NC. Three maritime units are fielded onboard the USS *Shiloh* (CG-67), USS *Blue Ridge* (LCC-19), and USS *Mount Whitney* (LCC-20). One shore facility has been installed at the Joint National Integration Center (JNIC) at Schriever AFB in Colorado. A second shore facility was installed in FY 2004 at the Deployable Joint Command and Control (DJC2) program facility in Panama City, Florida. These shore sites will be used to analyze the capability's relevance to the Ballistic Missile Defense (at JNIC) and Air and Missile Defense (at DJC2) and demonstrate the system's unique functionality to the joint community.

Developer/Manufacturer: AADC Prototype: Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland. AADC Production unit: General Dynamics Advanced Information Systems, Greensboro, North Carolina.

ALMDS
Airborne Laser Mine Detection System

Description: The Airborne Laser Mine Detection System (ALMDS) is an organic, high-area coverage, electro-optic Airborne Mine Countermeasures (AMCM) laser system that detects, classifies, and localizes floating and near-surface moored sea mines. Deployed from the MH-60S helicopter, ALMDS will satisfy the Navy's need for a quick-response, wide-area, organic MCM reconnaissance system that can rapidly detect and classify mine-like contacts for subsequent prosecution. This capability will be critical in littoral zones, confined straits, choke points, and Amphibious Objective Areas. ALMDS offers a much greater area search rate than other types of AMCM equipment, and it represents a capability that does not exist in the current inventory.

Program Status: A competitive contract was awarded in April 2000 for development of an integrated ALMDS system for the MH-60S. Milestone C and full rate production are scheduled for FY 2004. ALMDS initial capability is scheduled for FY 2005.

Developer/Manufacturer: Northrop Grumman, Melbourne, Florida.

AQS-20A
Mine-Hunting Sonar

Description: The AQS-20A is an underwater mine-detection sonar that also employs an Electro-Optic Identification (EOID) sensor capable of locating and identifying bottom, close-tethered, and moored sea mines. The AQS-20A mine-hunting system will be deployed and operated from the MH-60S helicopter as one of five organic Airborne Mine Countermeasures (AMCM) weapon systems resident in the carrier battle group. The AQS-20A system will also serve as the mine sensor subsystem of the Remote Mine Hunting System (RMS) hosted onboard Navy surface warships. The operational RMS system will be installed in the *Arleigh Burke* (DDG-51) Flight IIA Aegis guided missile destroyers beginning with DDG-91. (See separate program summaries for the MH-60S,RMS, and DDG-51 programs.)

Program Status: The AQS-20A is currently in post-MS II EMD. ASN RDA approved LRIP procurement of six systems in September 2000 for initial MH-53E operation and testing. Milestone C and the system's IOC are scheduled during CY 2005.

Developer/Manufacturer:
Raytheon Corporation, Portsmouth, Rhode Island.

IPDS CBR Defense
Improved Point Detector System
Chemical/Biological/ Radiological

Description: The Improved Point Detector System will extend the CBR (Chemical, Biological, Radiological) capabilities of the Chemical Agent Detector installed on Navy ships by adding an automatic nerve and blister agent vapor detector and alarm system.A key feature is an expandable agent recognition library with the ability to exclude interference and reduce false alarms.

Program Status: The program achieved Milestone III in July 1995,and the production contract was awarded in October 1996. First article testing was completed in December 1998. Production deliveries began in August 1999, with an inventory objective of 235 systems and a projected installation rate of 60 systems per year.

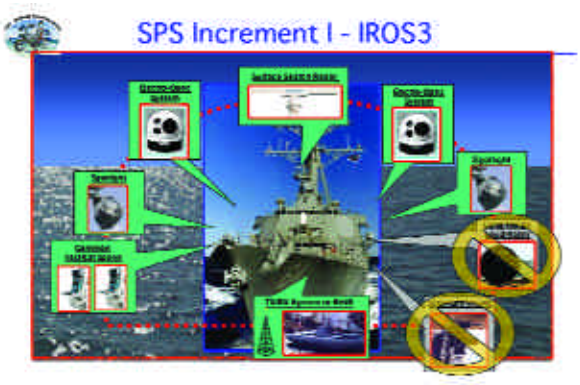
Developer/Manufacturer:
Powertronic Systems, Inc., New Orleans, Louisiana.

Integrated Radar/Optical Sighting and
Surveillance System (IROS3)

Description: This is the Situational Awareness component of the Shipboard Protection System (SPS) Increment one. IROS3 employs COTS-based / Open Architecture products, and its key components include SPS-73 or equivalent surface search radar, electro-optical/infra-red devices, an integrated surveillance system, spotlights, long range acoustic devices, and remotely operated stabilized small arms mounts. A prototype system is installed in USS Ramage to gain fleet feedback, lessons learned, and integrated logistics support information.

SPS increment I is designed to augment current Naval Force

Protection Tactics and Doctrine by providing a means to detect, classify and engage real-time asymmetric threats at close-range to ships in port, at anchor, and while transiting choke points or operating in restricted waters. The system provides 360-degree Situational Awareness (SA) and employs COTS integration to support incremental modifications as needed to tailor the system to the mission. IROS3 provides the capability to bridge current and future technology to ships by integrating current Force Protection initiatives and combat system technologies while sustaining mission-capable combatant force levels.



Program Status: CDD is scheduled for completion in September 2004. CPD will follow to set up for FY 05 procurement. Current PB05 funding procures approximately 75 ship sets.

Developer/Manufacturer: Naval Surface Warfare Center, Crane, Indiana; and Science Applications International Corporation, Arlington, Virginia.

Nulka
Radar Decoy System

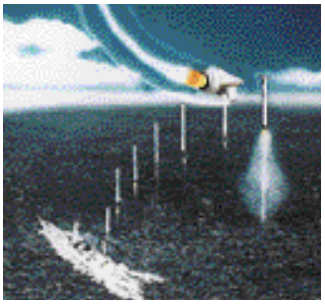
Description: Nulka is an active, off-board, ship-launched decoy developed in cooperation with Australia to counter a wide spectrum of present and future radar-guided anti-ship cruise missiles. The Nulka decoy employs a broadband radio frequency repeater mounted atop a hovering rocket platform. After launch, the Nulka decoy radiates a large,ship-like radar cross-section flying a trajectory that seduces and decoys incoming ASCMs away from their intended targets. Australia developed the hovering rocket, launcher, and launcher interface unit. The U.S. Navy developed the electronic payload and fire control system. The existing Mk 36 Decoy Launching System (DLS) has been modified to support Nulka decoys, resulting in the Mk 53 DLS.

Program Status: Nulka received Milestone III approval for Full-Rate Production in January 1999; installation began on U.S. and Australian warships September 1999. Procurement objective is 491 Nulka MK-234 Active Electronic Decoy systems FY 2004-2009.

Developer/Manufacturer: BAEs, Australia; SECHAN Electronics Inc, Lititz, Pennsylvania, and Sippican, Marion, Massachusetts.

OASIS
Organic Airborne and Surface Influence Sweep

Description: The OASIS system will provide the strike group with an organic, high-speed, magnetic/acoustic influence minesweeping capability to effectively neutralize sea mine threats in operating areas where mine hunting is not possible due to mine burial or high bottom clutter. The OASIS system is one of five under-development Airborne Mine Countermeasures (AMCM) weapon systems to be deployed and operated from the MH-60S helicopter (see MH-60S program summary). OASIS will be designed not to preclude future deployment and operation from selected surface craft.



Program Status: The OASIS program is fully funded in the Navy's FY 2004 budget, and IOC is scheduled during FY 2008. The

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OASIS program will procure three systems in FY 2007, 16 in FY 2008,and 29 in FY 2009.

Developer/Manufacturer: EDO Corporation, New York.

SPQ-9B ASCM Radar
Anti-Ship Cruise Missile Radar Improvement Program

Description: The SPQ-9B is a slotted phased-array rotating radar that significantly improves the ability of ships to detect and track low-altitude anti-ship cruise missiles (ASCMs) in a heavy clutter environment. The SPQ-9B is a high-resolution track-while-scan, X-band, pulse-Doppler radar that enables detection and establishment of a firm track at ranges that will allow the combat system to engage subsonic or supersonic sea-skimming missiles at the outer edge of a ship's engagement envelope. SPQ-9B integrates with SSDS Mk 2 on aircraft carriers and amphibious assault ships (LHDs). The upgrade package improves those ships' ASCM defense capabilities to pace the evolving worldwide threat. The SPQ-9B is also an integral part of the Cruiser Modernization program, providing an ASCM cue to the Aegis Combat System.

Program Status: The SPQ-9B Operational Test and Evaluation has completed and is being fielded in conjunction with SSDS M-2 and CG Modernization.

Developer/Manufacturer: Northrop Grumman, Melville, New York.

SPY-1 Radar
Aegis Multi-function Phased-Array Radar

Description: The SPY-1 radar system is the primary air and surface radar for the Aegis Combat System installed in the *Ticonderoga* (CG-47) and *Arleigh Burke* (DDG-51)-class warships. It is a multi-function, phased-array radar capable of search, automatic detection, transition to track, tracking of air and surface targets,and missile engagement support. The third variant of this radar, SPY-1D(V), known as the Littoral Warfare Radar, improves the radar's capability against low-altitude, reduced radar cross-section targets in heavy clutter environments, and in the presence of intense electronic countermeasures. The SPY-1 Series radars also demonstrated the capability to detect and track theater ballistic missiles.

Program Status: The SPY-1D(V) littoral radar upgrade superseded the SPY-1D in new-construction Flight IIA destroyers beginning in FY 1998. SPY-1D(V) was installed in DDGs-91 through 98 and planned for installation in DDGs 99 through 112.

Developer/Manufacturer:
Lockheed Martin, Moorestown, New Jersey.

Solid-State SPY Radar
Next-generation Multi-function Active Phased-Array Radar

Description: The Solid-State SPY (SS-SPY) radar system is being developed as the primary air and surface radar for the Navy's next-generation Cruiser. It is a multi-function, active phased-

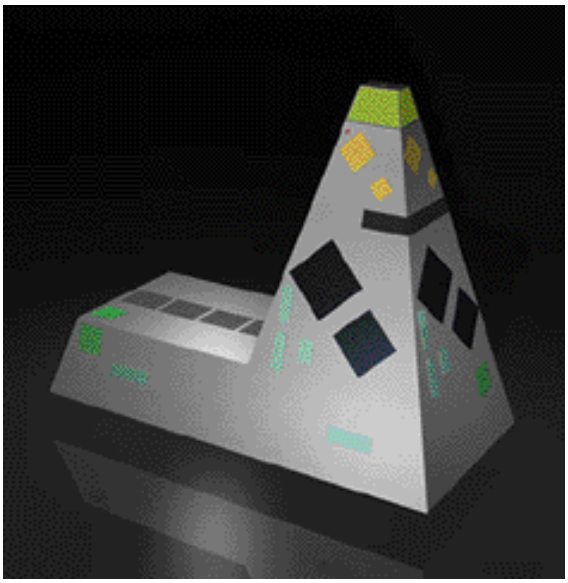
array radar capable of search, detection, tracking of air and surface targets, and missile engagement support. The advanced functions of this radar include multi-mission performance in a stressing environment that will enable simultaneous defense of all Theater Air and Missile Defense (TAMD) threats. The multi-mission capability will be effective in both air dominance of the battlespace and in defense against ballistic missiles.

Program Status: The SS-SPY Radar is being developed as a competitive program through two research and development programs: the S-Band Advanced Radar prototype and the Active S-Band Radar program for the USNS Observation Island replacement ship. Down-select for the SS-SPY program is planned for 2009.

Developer/Manufacturer: To be determined.

SPY-3 MFR
Multi-Function Radar

Description: The AN/SPY-3 Multi-Function Radar (MFR) is an X-band active phased-array radar designed to meet all horizon search and fire control requirements for the 21st-century Fleet. MFR is designed to detect the most advanced low-observable anti-ship cruise missile (ASCM) threats and support fire-control illumination requirements for the Evolved Sea Sparrow Missile (ESSM, see separate program summary) and future missiles required to engage the most stressing ASCMs.MFR also supports new ship-design requirement for reduced radar cross-section, significantly reduced manning (no operators), and total ownership cost reduction. MFR is planned for introduction in DD(X), LHA(R) and next-generation CVN-21 aircraft carriers (see separate program summaries).



Program Status: Engineering and Manufacturing Development unit build is underway for development, testing, and follow-on production of MFR to support equipment delivery schedules for DD(X), CVN-21, and LHA(R). MFR will be fielded as an integrated radar with the S-Band Volume Search Radar (VSR), together referred to as the "Dual-band Radar Suite" (DBRS). The EDM is being tested at Wallops Island Test Facility through FY 2006. OPEVAL will occur with DD(X) testing. IOC for the DBRS is expected to be 2013.

Developer/Manufacturer: To be determined.

S-VSR
S-Band Volume Search Radar

Description: The S-band Volume Search Radar (S-VSR) is an S-band active phased-array radar designed to meet all above-horizon detection and tracking requirements for the 21st-century ships without area air-defense missions.S-VSR will provide long-range situational awareness with above horizon detection,and air control (marshalling) functionality, replacing the functionality of today's SPS-48E, SPS-49 and SPN-43 radars. A non-rotating phased array, S-VSR provides the required track revisit times to deal with fast, low/very low-observable, and high-diving missile threats, providing cueing for AN/SPY-3 Multi-Function Radar

S-VSR ➢

(MFR) to conduct required tracking and fire control functions above the horizon.

Program Status: Engineering and Manufacturing Development unit build is underway for development, testing, and follow-on production of S-VSR to support equipment delivery schedules for DD(X), CVN-21, and LHA(R). S-VSR will be fielded as an integrated radar with the AN/SPY-3 Multi-function Radar (MFR), together referred to as the "Dual-band Radar Suite" (DBRS). The S-VSR EDM will be integrated with MFR and tested at Wallops Island Test Facility through FY 2006. OPEVAL will occur with DD(X) testing. IOC for the DBRS is expected to be 2013.

Developer/Manufacturer:
Northrup Grumman Ship Systems, Pascagoula Mississippi.

SQQ-89
Anti-Submarine Warfare Combat System

Description: The SQQ-89 ASW combat system suite provides *Oliver Hazard Perry* (FFG-7), *Spruance* (DD-963), *Ticonderoga* (CG-47),and Arleigh Burke (DDG-51) surface warships with an integrated undersea warfare detection, classification, display, and targeting capability. The system combines and processes all sonar information, and processes and displays all SH-60B Light Airborne Multi-Purpose System (LAMPS) Mk III sensor data. The current system comprises the following subsystems:

- **SQS-53C/D active/passive hull-mounted sonars (SQS-56 in FFGs)**
- **SQR-19 Tactical Towed Array System (TACTAS)**
- **Mk 116 ASW fire control system**
- **SQQ-28 sonobuoy processor**
- **SRQ-4 SH-60B helicopter data link**
- **UYQ-25B Sonar In-situ Mode Assessment System (SIMAS)**
- **USQ-132 Tactical Display Support System (TDSS)**
- **SQQ-89(T) Onboard Trainer (OBT)**

The analog receivers of the SQS-53A/B hull-mounted sonars are being upgraded to digital by the use of COTS processors, and are redesignated SQS-53D. Planned improvements to the SQQ-89(V) include:

- **MH-60R (LAMPS Mk III) integration**
- **SRQ-4 Data Link Upgrade**
- **Multi-Function Towed Array (MFTA) that will provide low and mid-frequency bi/multi-static receiver capability between the SQS-53C,the MH-60R Airborne**
- **Airborne Low-Frequency Active Sonar (ALFS), and off-board systems**
- **Remote Minehunting System (RMS) processing and display**
- **Echo Tracker Classifier (ETC) active classification capability**
- **SIMAS upgrade to updated performance prediction models**
- **Computer-Aided Dead-Reckoning Table (CADRT)**
- **Torpedo Recognition and Alertment Functional Segment (TRAFS)**

Program Status: New system acquisitions are for DDG-51 new-construction. Required modernization of existing systems for the shallow water littoral warfare environment is being accomplished by the use of COTS processors and displays. Starting in FY 2003, SQQ-89(V)15+MFTA systems, designated SQQ-89A(V)15, are being procured for backfit installations in CG-47 surface warships, with DDG-51 warships beginning backfit in FY 2011. A total of 24 systems (19 DDG forward-fit, 5 CG backfit) are planned for installation between FY 2004 and FY 2009.

Developer/Manufacturer: Lockheed Martin, Syracuse, New York.

SSDS
Ship Self-Defense System

Description: SSDS provides the integrated combat system for aircraft carriers and amphibious ships, enabling them to keep pace with the anti-ship cruise missile (ASCM) threat. Moving toward an open-architecture distributed-processing system, SSDS integrates the detection and engagement elements of the combat system. With automated weapons control doctrine, Cooperative Engage-ment Capability (CEC), and enhanced battlespace awareness, SSDS provides these ships with a robust self-defense capability in support of Sea Shield.

Program Status: SSDS was approved for full rate production following operational testing in 1997. Initial Operational Capability (IOC) occurred in 1997 with the deployment of SSDS Mk 1 in the USS *Ashland* (LSD-48). SSDS Mk 1 has subsequently been installed in all 12 *Whidbey Island* (LSD-41)-class ships. A more advanced version,SSDS Mk 2,is being fielded in aircraft carriers, the USS *Wasp* (LHD-1) and *San Antonio* (LPD-17) ship classes. By the end of 2009, 21 ships will have received the SSDS Mk2 system,including the Self-Defense Test Ship.

Developer/Manufacturer: Raytheon, San Diego, California. Technical support: Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland and Naval Surface Warfare Center Port Hueneme Division (NSWC/PHD), Dam Neck, Virginia.

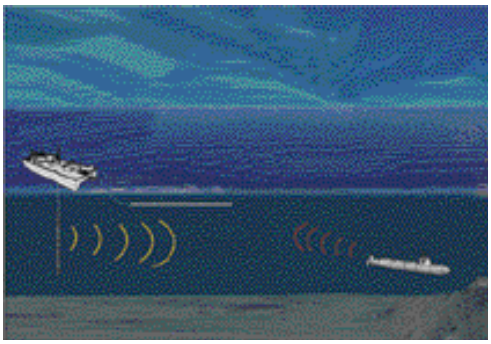
UQQ-2 SURTASS
Twin-Line Array Surveillance Towed Array Sensor System

Description: The SURTASS capability consists of a mobile fleet of five ships that employ the Fleet's most capable deep and shallow water (littoral zone) passive-acoustic towed-array sonar systems. These ships provide passive detection of quiet nuclear and diesel submarines and real-time reporting of surveillance information to theater commanders and operational units.SURTASS employs either a long-line passive-sonar acoustic array or a shorter twin-line passive-sonar acoustic array. The twin-line system is the best operational shallow water towed array and the only multi-line towed array in the Navy. It consists of a pair of arrays towed side-by-side from a SURTASS ship and offers significant advantages for undersea surveillance operations in the littoral zone. It can be towed in water as shallow as 180 feet, provides significant directional noise rejection, offers bearing ambiguity solution without turning, allows the ship to tow at higher speed, and results in a shorter time to stabilize the array after a turn.

Program Status: Four SURTASS vessels were decommissioned in FY 2003, and the remaining five are being transferred to the Pacific Fleet. A twin-line Engineering Development Model, comprising two modified A-180R SURTASS legacy arrays, is currently installed on the USNS Assertive (T-AGOS-9). The first production model TB-29A twin-line SURTASS array will be available in FY 2005, and all SURTASS vessels will have TB-29A twin line arrays by FY 2006.

Developer/Manufacturer: Johns Hopkins University/APL,Laurel, Maryland; IUSS Operations Support Center, Norfolk, Virginia; Raytheon, Long Beach, California; Digital System Resources, Fullerton, California; and Raytheon, Portsmouth, Rhode Island.

UQQ-2 SURTASS/LFA Surveillance Towed Array Sensor System/ Low-Frequency Active



Description: The LFA system,the active adjunct to the SURTASS sonar system,is capable of making long-range detections of submarine and surface ship contacts. It comprises a low-frequency active sonar transmitter deployed below a SURTASS ship and uses the SURTASS passive towed array as the receiver. Other Navy ships with towed arrays and with the SURTASS processing system can also process the LFA signal returns in what is known as a "bi-static" mode. As a mobile system, SURTASS/LFA can be employed as a force-protection sensor wherever the force commander directs, including in forward operating areas or in support of battle group activities.A UHF SATCOM communication system provides direct voice and data connectivity between the SURTASS/LFA ship and tactical platforms.

Only one LFA system exists,and it is installed onboard the leased RV *Cory Chouest*. LFA will be installed on USNS *Impeccable* (T-AGOS-23, see the separate program summary) when it becomes operational. Development continues for future LFA-type active systems employing smaller, lighter sources in support of development of a rapidly deployable LFA source for use in the littorals.

Program Status: SURTASS LFA, following a five-year Environmental Impact Statement (EIS) process, obtained authorization to conduct routine operations and training. Several non-governmental organizations filed suit,alleging violation of various environmental laws. In October 2003 a Federal District Court enjoined testing and training with LFA for violation of the procedural requirements of the Marine Mammal Protection Act, Endangered Species Act, and National Environmental Policy Act, notwithstanding the court's finding that a national security need existed for employment of LFA and commending the Navy for the breadth of scientific research supporting the EIS. Subject to this injunction and possible future appeal of the court's decision,LFA may conduct operations only in certain areas within the East China Sea, South China Sea, and the Sea of Japan. Currently the program consists of one leased vessel capable of active and passive operations and one vessel in sea trials (Operational in FY 2004).

Developer/Manufacturer: Raytheon Systems, Portsmouth, Rhode Island; Lockheed Sanders, Manchester, New Hampshire; and Alpha Marine, Galliano, Louisiana.

Sea Base

Platforms

Aircraft

C-37A
VP-3A Replacement Aircraft

Description: The Navy maintains executive transport airlift to support the Navy Departments' DoD 4500.46-designated "required users." Required users must use non-commercial air transport and have specified needs for secure communications and security. The airlift is currently provided by one C-37 (Gulfstream V), two C-20Ds (Gulfstream III) aircraft, and aging VP-3A Orions. Two of the VP-3As, already at the end of their service lives, are being operated on waivers and will be retired. The decreased reliability of the VP-3s frequently necessitates use of a backup aircraft. The C-37 Gulfstream V aircraft will eventually replace all VP-3As, and lower operating costs of the C-37 should provide a payback for their acquisition cost within ten years. The C-37 meets all known ICAO-imposed Air Traffic Management communications, navigation, and surveillance requirements through FY 2007.

Program Status: Congress funded the first C-37A aircraft in FY 2001 and added a second aircraft in FY 2004. Subsequent Navy aircraft procurement appropriations will fund aircraft number three through five, which are funded in the FYDP. The first aircraft was delivered to the Navy in August 2002 and is based in Washington, D.C. A backup UP-3 has been assigned to CPF Executive Transport Detachment in order to meet CPF executive transport requirements as the aging VP-3 is experiencing reduced reliability due to reduced mission capability rates. Additionally, the Navy acquired a surplus USAF C-20A in order to meet CNE executive transportation requirements from February 2004 until delivery of the fourth C-37 aircraft in FY 2011. The Navy is using standard commercial practices to acquire the C-37, which is maintained under full civilian contractor logistics support and warranty—20 years for airframe, five years for engines, and six years for the auxiliary power unit.

Developer/Manufacturer: Gulfstream (Division of General Dynamics), Savannah, Georgia.

C-40A Clipper NUFEA (RA)
Navy-Unique Fleet Essential Airlift Replacement Aircraft

Description: The Naval Air Force Reserve provides 100 percent of the Navy's organic intra-theater logistics airlift capability-Navy Unique Fleet Essential Airlift (NUFEA). NUFEA provides Navy Combatant Commanders with short-notice, fast response intra-theater logistics support for naval power projection worldwide. Twenty-seven aging C-9 aircraft, which currently perform the majority of these services, are being replaced by the C-40A Clipper, a modified Boeing 737-700 series aircraft. This state-of-the-art aircraft can transport 121 passengers (passenger

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FC-40A Clipper NUFEA (RA) ➢

configuration), 40,000 pounds of cargo (cargo configuration), or a combination of the two (combination configuration),at ranges greater than 3,000 miles at 0.8 Mach cruise speed. The ability to carry simultaneously cargo pallets and passengers maximizes operational capability, safety, and capacity. C-40A features include a new wing with an advanced-technology airfoil; an electronic flight deck fully compliant with future communications, navigation, and air traffic control architectures; advanced-technology Stage III noise-compliant, fuel-efficient engines; and an integral cargo door/cargo handling system. Maximum gross takeoff weight is 171,000 pounds. Until reaching the C-40 aircraft inventory objective, C-9 aircraft will need communication/navigation system (CNS) updates in order to comply with Global Air Traffic Management/International Country requirements.

Program Status: Congress, through National Guard and Reserve Equipment Appropriations, funded the first five C-40A aircraft, the first of which were delivered to the Navy in March 2001. The Navy is purchasing the aircraft using standard best commercial practices and has ordered a total of eight C-40As. Congress added a seventh aircraft in the FY 2003 budget, and the Navy acquired an eighth in the FY 2004 budget. Seven more aircraft are planned across the FYDP. Three aircraft are stationed in Fort Worth, Texas,and three aircraft are stationed in Jacksonville, Florida.

Developer/Manufacturer: Boeing, Seattle, Washington.

KC-130J
Hercules Tactical Tanker and Transport

Description: The KC-130 is a multi-role, multi-mission tactical aerial refueler and tactical transport aircraft, well suited to the mission needs of the forward-deployed Marine Air-Ground Task Force. The Hercules is the only long-range assault support capability organic to the Marine Corps. This aircraft provides fixed-wing, rotory-wing, and tilt-rotor tactical in-flight refueling; rapid ground refueling of aircraft and tactical vehicles; assault air transport of air-landed or air-delivered personnel, supplies, and equipment; command-and-control augmentation;battlefield illumination; tactical aeromedical evacuation; and search and rescue support. The new KC-130J, with its increase in speed and range, improved air-to-air refueling system, night systems, and survivability enhancements, will provide the MAGTF commander with state-of-the-art, multi-mission, tactical aerial refueler/transport well into the 21st Century.

Program Status: Seventeen aircraft are currently on contract, 11 of which have been delivered. Additional KC-130Js will be procured through a multi-year procurement program, with an acquisition objective of 51 aircraft.

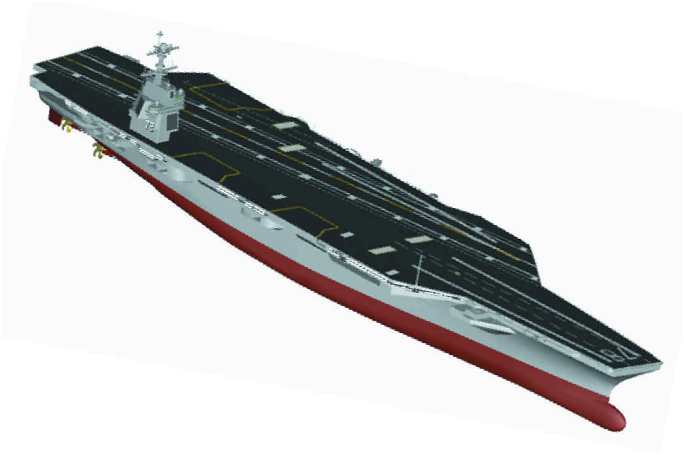
Developer/Manufacturer: Lockheed Martin, Marietta, Georgia.

Aircraft Carriers

CVN-68 *Nimitz* Class and CVN-21 Next-Generation Nuclear-Powered Carriers

Description: *Nimitz* (CVN-68)-class nuclear-powered aircraft carriers are replacing the Navy's aging conventionally powered (oil-fired) carriers on a one-for-one basis, preserving and recapitalizing aircraft carrier strike group force levels to meet forward-presence,crisis-response,and warfighting requirements. The mission of the *Nimitz*-class aircraft carriers is to support and operate aircraft that engage in attack, surveillance, and electronic warfare against targets at sea, in the air, or ashore in support of Marines or joint forces. America's 12 carriers are forward-deployed world wide in support of U.S. strategy and commitments and are increasingly important as the Navy adjusts its emphasis toward littoral regions, and forward-deployed land-based forces are brought home to the United States. Since the mid/late-1960s when the baseline CVN-68 design was finalized, the Navy's carrier force has not had the advantage of an aggressive and robust research and development program to insert leading-edge technologies and systems into subsequent hulls.

For this reason,and to ensure that the carrier/naval aviation force could meet the daunting operational requirements of the next century, in 1993 the Navy established a future sea-based air platforms working group to investigate the requirements, available technologies and systems, and needed RD to ensure that a new class of aircraft carriers could capture elements of the incipient Revolutions in Military and Business Affairs. Based upon these initial studies, the Navy established an approach and program to develop an evolutionary-design next-generation nuclear carrier, CVN-21, to reach the Fleet in 2014. The next generation carrier will continue to be the centerpiece of Sea Power 21 and will incorporate ElectroMagnetic Aircraft Launch System (EMALS), electrical generation capacity of nearly three times that of the *Nimitz*-class carrier, improved sortie generation rate and do it all with a significantly less manpower than today's ship/air wing team. Crew quality of life improvements are also a focus for CVN-21 as we expect this class of ship to ply the world's oceans until 2108. Initial investments will be made in new integrated combat systems for CVN-77, which will be carried forward,along with other improvements, into the CVN-21 and follow-on carriers, for example, an advanced life-of-ship nuclear plant and integrated electrical distribution system. The principal design objectives for the CVN-21 class are to provide a flexible infrastructure that will facilitate the insertion of new warfighting capabilities as they evolve and reduce total ownership costs significantly during each carrier's 50-year service life.



Program Status: There are currently nine Nimitz-class nuclear carriers in active service. George H. W. Bush (CVN-77), the tenth and final ship of the class, is under construction and is scheduled to deliver in March 2008. CVN-77 is a modified-repeat of the USS Ronald Reagan (CVN-76), and will replace the fossil-fueled carrier USS Kitty Hawk (CV-63), after 47 years of service. CVN-77 will serve as a transition ship to the first hull

CVN-68 & CVN-21 ➢

built as part of the CVN 21-class of aircraft carriers. A multi-year research and development program is underway for these future carriers.

The President's FY 2006-2011 Future Years Defense Plan includes split funding for construction of CVN 78, requested in FY 2007 and FY 2008, in order to maintain essential carrier force levels. CVN 78 is slated to replace the Navy is first nuclear carrier, USS Enterprise (CVN-65), after 53 years of operational use.

CVN-79 and CVN-80 will be follow-on,spirally developed,CVN 21-class ships, currently planned for construction starts at intervals necessary to maintain a 12-carrier fleet.

Developer/Manufacturer: Northrop Grumman Newport News, Newport News, Virginia.

Submarines

SSGN
Nuclear-Powered Guided-Missile Submarine

Description: The first four of the *Ohio*-class Trident fleet ballistic missile submarines (SSBNs) are being converted to nuclear-powered guided missile and special-operations submarines (SSGNs). The *Ohio*-class SSBN is the Navy's contribution to the nation's strategic deterrent posture, which also includes long-range manned bombers and land-based intercontinental ballistic missiles. The SSBN is the most survivable and enduring leg of the "Strategic Triad" and therefore is one of the Navy's highest policy, program, and operational priorities. The first eight *Ohio*-class ships were configured to carry 24 Trident I/C4 submarine-launched ballistic missiles (SLBMs). The ninth ship, the USS Tennessee (SSBN-734) and all later ships are armed with the Trident II/D5 missile system. Trident missiles are capable of carrying Multiple Independently Targeted Reentry Vehicles (MIRVs); in operation Trident II/D5 missiles have been declared at eight MIRV warheads while Pacific Fleet Trident I/C4 missiles have been declared at six under the Strategic Arms Reduction Treaty (START). All 18 of the *Ohio*-class SSBNs have been commissioned; the final ship of the class, the USS *Louisiana* (SSBN-743),joined the Fleet in FY 1997. In FY 2000,the last four of the original eight ships began conversion to carry the Trident II/D5 missile.

The first four *Ohio*-class SSBNs converted to the SSGN configuration will be able to carry up to 154 Tomahawk (TLAM/TACTOM) land-attack missiles to conduct large-volume strike with surprise. While on station, with unparalleled non-provocative persistent presence, the SSGN will prepare the knowledge battlespace, using UUVs and other sensors, to enable access for follow-on forces. The SSGN will also have the capability to support a Special Operations Force (SOF) contingent of up to 66 personnel for an extended period of time, providing clandestine insertion and retrieval via built in lockout chambers, dry deck shelters, or the Advanced SEAL Delivery System (ASDS). Operating with two crews and using the existing Trident infrastructure will allow this potent warfighting capability to

have a 70 percent in-theater presence. Additionally, the large payload and ocean interface of 24 seven-foot diameter tubes will allow these transformational submarines to leverage future payloads and sensors, thereby increasing the submarine force's future capabilities.

Program Status: The first two ships, the USS *Ohio* (SSBN-726) and USS *Florida* (SSBN-728), begin their refueling and conversion overhauls in FY 2003. The USS *Michigan* (SSBN-727) and USS *Georgia* (SSBN-729) will begin their conversion in FY 2004 and FY 2005, respectively. The first SSGN will be operational in FY 2007. The anticipated cost for all four SSGN conversions is roughly $4 billion.

Developer/Manufacturer: General Dynamics' Electric Boat Corporation, Groton, Connecticut.

SSN-21 *Seawolf* Class Nuclear-Powered Attack Submarine

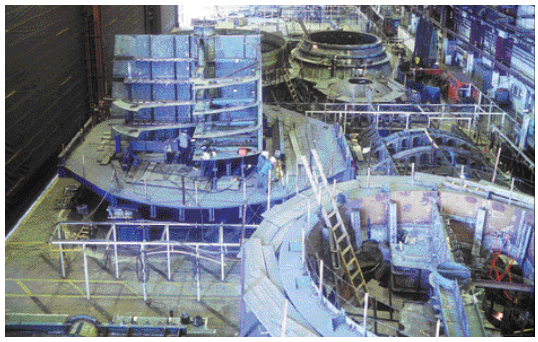
Description: The *Seawolf*-class attack submarines provide robust open-ocean sea-control capabilities against current and future submarine threats, as well as significant multi-mission littoral warfare capabilities. The design emphasis in the *Seawolf* class is on high-speed, submerged, deep-depth operations, with significantly improved machinery quieting, combat systems, sensor systems, and payload capacity compared to the Improved *Los Angeles* (SSN-688I) attack submarines (SSN-751 and later units). Continuing trials of the SSN-21 have confirmed the ship's superior capabilities in all critical warfighting areas.

Program Status: The USS *Seawolf* was commissioned in July 1997, and the USS *Connecticut* (SSN-22), in December 1998. The third submarine of the class, *Jimmy Carter* (SSN-23), is under construction and will deliver in 2005. *Jimmy Carter* will be a unique multi-mission platform modified with additional volume and services to accommodate advanced technology for naval special warfare and tactical surveillance operations. The details of this modification and the advanced technologies, while classified, will support the Defense Science Board's 1998 recommendations for improved payload capabilities and a flexible interface with the undersea environment. This will be accomplished without sacrificing current *Seawolf* class multi-mission warfighting capability and stealth.

Developer/Manufacturer: General Dynamics' Electric Boat Corporation, Groton, Connecticut.

SSN-774 *Virginia* Class Nuclear-Powered Attack Submarine

Description: The *Virginia* class will provide advanced acoustic technology and will perform traditional open-ocean anti-submarine and anti-surface missions, yet are specifically designed for multi-mission littoral and regional operations. These advanced submarines will be fully configured to conduct mining and mine reconnaissance, Special Operations Forces insertion/extraction, battle group support, intelligence-collection and surveillance missions,sea-control,and land attack. Further, the *Virginia* SSNs



SSN-774 ➢

will be specifically configured to adapt easily to special missions and emerging requirements.

The 30-ship SSN-774 program is the first major program to implement acquisition reform initiatives fully. The tenets of the *Virginia* class affordability are Integrated Product and Process Development (IPPD), modular construction, parts reduction, and aggressive insertion of advanced COTS technologies and an open-architecture computing environment. The IPPD concept teams the Navy, shipbuilders, designers,and vendors to assure the most efficient and effective design early in the design process. Modular construction allows construction, assembly, and testing of systems prior to installation in the ship's hull,thereby reducing costs, minimizing rework, and simplifying system integration. The ship's modular design will also facilitate technology insertion in both new-construction future ships and backfit into existing ships,throughout their 30-year service lives.

Program Status: The first four ships are being built under an innovative teaming arrangement between General Dynamics' Electric Boat Corporation (EB) and Northrop Grumman Newport News (NGNN). Under the teaming arrangement, construction of the first four ships will be shared by ship section. NGNN is building the bow, stern, sail, and selected forward sections for each submarine. EB is building the hull sections, the engine room modules, and the command-and-control system operating spaces. EB will assemble and deliver the first and third ships; NGNN, the second and fourth. Construction of *Virginia* began in 1998, and the second submarine of the class, *Texas* (SSN-775), began construction in FY 1999. The third ship of the class, *Hawaii* (SSN-776), began construction in 2001, and construction on *North Carolina* (SSN-777) began in 2002. *Virginia* class acquisition continues throughout the FYDP, at a rate of one ship per year through FY 2008, after which the Navy's program shows two SSNs per year to sustain required force levels. The FY 2004 request included the second SSN in the five-year contract; cost savings around $80 million per hull or $400 million over the course of the multi-year contract.

Developer/Manufacturer: General Dynamics' Electric Boat Corporation, Groton, Connecticut, and Northrop Grumman Newport News, Newport News, Virginia.

Surface and Expeditionary Warfare Ships and Craft

CG-47 *Ticonderoga* Class Aegis Guided-Missile Cruiser Modernization

Description: The 27 *Ticonderoga* (CG-47)-class guided missile cruisers have combat systems centered on the Aegis Weapon System and the SPY-1 multi-function, phased-array radar. Ticonderoga-class cruisers provide multi-mission offensive and defensive capabilities, and operate independently or as part of Carrier Strike Groups (CSG), Expeditionary Strike Groups (ESG) and Surface Action Groups (SAG) for Global CONOPS. The *Ticonderoga* class combat system includes the Standard Missile (SM-2), unparalleled air warfare systems, advanced anti-submarine and anti-surface warfare systems, embarked sea-control

helicopters, and robust command-control-and-communications systems in a potent, multi-mission warship. In addition,22 of the 27 cruisers are equipped with the Mk 41 Vertical Launching System (VLS), giving them a significant surface fire capability with the Tomahawk Land-Attack cruise Missile (TLAM) and, in the future, the Tactical Tomahawk.

Program Status: The 22 VLS-capable Aegis cruisers are planned for Cruiser Modernization beginning in Fiscal Year 2006,and will receive upgrades in Air Dominance (Cooperative Engagement Capability, SPY radar upgrades), Maritime Force Protection (CIWS 1B, ESSM, Nulka, SPQ 9B), undersea warfare (SQQ 89A(V)15) and service life (SmartShip, all-electric auxiliaries, weight and moment). The cruisers are viable candidates for a ballistic missile defense role. The Cruiser Modernization warfighting improvements will extend the Aegis combat system's capabilities against projected threats well into the 21st century and, with the DDG-51 destroyers,serve as the bridge to the Surface Combatant Family of Ships [DD(X), LCS, and CG(X)].

Developer/Manufacturer: General Dynamics, Bath Iron Works, Bath, Maine; Northrop Grumman Ship Systems, Pascagoula, Mississippi; and Lockheed Martin, Moorestown, New Jersey.

DDG-51 *Arleigh Burke* Class Aegis Guided-Missile Destroyer

Description: The state-of-the-art DDG-51 guided missile destroyers have combat systems centered on the Aegis Weapon System and the SPY-1D multi-function, phased-array radar. The *Arleigh Burkes*' combat system includes the Mk 41 Vertical Launching System (VLS), an advanced anti-submarine warfare system, advanced anti-air warfare missiles, and Tomahawk cruise missiles. Incorporating all-steel construction and gas-turbine propulsion, DDG-51 destroyers provide multi-mission offensive and defensive capabilities and can operate independently or as part of carrier strike groups, surface action groups, and expeditionary strike groups. The Flight IIA variants currently under construction incorporate facilities to support two embarked helicopters,significantly enhancing the ship's sea-control capabilities. These ships have the Aegis combat system Baseline 6 Phase 3, which incorporates Cooperative Engagement Capability (CEC) and Evolved Sea Sparrow Missile (ESSM) warfighting capabilities. The improved SPY-1D(V) radar, the Remote Mine-Hunting System (RMS), as well as advanced open-architecture combat systems using commercially developed processors and display equipment. These capabilities are being introduced as part of Baseline 7 Phase I, commencing with USS *Pickney* (DDG-91). Together with the Cruiser Modernization program, these highly capable warships will be the bridge to the next-generation Surface Combatant Family of Ships: LCS (Littoral Combat Ship), DD(X) and CG(X).

Program Status: Forty-three Arleigh Burke destroyers have been delivered or were in service at the end of FY 2003; with a total of 62 to be delivered at the end of production. Three flight IIA ships were delivered in FY 2003: the USS *Mason* (DDG-87) and USS *Chafee* (DDG 90) from Bath Iron Works,and USS *Mustin* (DDG-

DDG-51 ➢

89) from Northrop Grumman. Four DDGs are scheduled for delivery in FY 2004. The purchase of the last three DDGs to complete a ship class of 62, is scheduled for FY 2005.

Developer/Manufacturer: General Dynamic Bath Iron Works, Bath, Maine; Northrop Grumman Ship Systems, Pascagoula, Mississippi; and Lockheed Martin, Moorestown, New Jersey.

DD(X)
21st-Century Destroyer

Description: After the 2001 Quadrennial Defense Review, and in conjunction with the Navy's recognition of the transformational imperatives of the future, the Navy determined that some revision to the development plan for the future surface warships was in order. A family of surface combatants will be required to meet future warfighting requirements – not just a single ship class. As the primary precision strike and volume-fires provider of the "family," DD(X) will be armed with Tactical Tomahawks (TACTOM) and the Advanced Gun System (AGS), which fires Long-Range Land-Attack Projectiles (LRLAP). (See separate program summaries.) DD(X) will provide sustained and precise firepower at long ranges to support forces ashore and will conduct independent attacks against land targets. With state-of-the-art network-centric information technologies, DD(X) will operate seamlessly with other naval, ground, and land-based air forces. The DD(X) program's emphasis on "sensor-to-shooter" connectivity will provide a naval or Joint Task Force commander with the multi-mission flexibility to destroy a wide variety of land targets while simultaneously countering maritime threats. DD(X) capabilities in undersea warfare, surface warfare, and air warfare are designed for enhanced performance in the littoral environment, providing an outstanding self defense capability and "Sea Shield" capability as part of the defense of other ships in the Expeditionary Strike Group or Carrier Strike Group. DD(X) will take advantage of advanced stealth technologies rendering it significantly less detectable to potential adversaries and more survivable to enemy attack than the ships it will replace.

DD(X) will feature an Integrated Power System (IPS) to provide power for advanced propulsion systems as well as combat systems and ship service loads. An open architecture distributed combat system will support a "plug-and-fight" environment in which to operate AGS, an advanced vertical launching system and a Multi-Function/Volume Search Radar suite. Other DD(X) features include an advanced hull form,integrated electric drive propulsion, optimal manning based on comprehensive human-systems integration and human-factors engineering studies, extensive automation, advanced apertures, and dramatic reductions across the entire spectrum of signatures (radar, acoustic,magnetic and infrared).DD(X) will use a "spiral-design" review process, ensuring that each of these breakthrough technologies responds to future operational requirements. Once validated for the precision-strike and volume-fires DD(X), appropriate technologies will be incorporated into other members of the family of surface combatants, including a CG(X) next-generation cruiser and the Littoral Combat Ship (LCS), as well as future carriers and amphibious ships.

Program Status: The Navy competitively awarded the DD(X) Phase III Contract to Northrop Grumman Ship Systems (NGSS) April 29, 2002 to perform as the DD(X) Design Agent and technology developer of the total ship system. Raytheon Systems, Inc is the systems integrator. The Design Agent is currently executing Phase III of the contract which includes development of 10 DD(X) Engineering Development Models (EDMs), designed to mitigate risk by testing and evaluating critical new technologies as they are developed and integrated into the overall ship design. DD(X) Phase III will culminate in a Milestone B decision in March 2005. In March 2004, ASN (RDA) announced that the Phase IV System Development and Demonstration Contract would be awarded to the current Design Agent, NGSS. Construction contracts for the first several ships will be equally distributed between NGSS and General Dynamics Bath Iron Works.

Developer/Manufacturer: Northrop Grumman Ship Systems (NGSS), Pascagoula, Mississippi is the lead Design Agent with Raytheon Systems, Inc, Sudbury, Massachusetts as systems integrator. NGSS has brought together a DD(X) National Team of over 80 companies, including Boeing, Lockheed Martin, United Defense Limited Partnership, and General Dynamics Bath Iron Works.

FFG-7 *Oliver Hazard Perry* Class Guided-Missile Frigate Modernization

Description: The FFG-7 *Oliver Hazard Perry* guided-missile frigates are capable of operating independently or as an integral part of a carrier strike group or surface action group. They are primarily used today to conduct maritime interception operations, presence missions and counterdrug operations. A total of 55 FFG-7 Perry-class ships were built—51 for the U.S. Navy and four for the Royal Australian Navy. Of the 51 ships built for the United States, 21 remain in active commissioned service, and nine are in the U.S. Naval Reserve Force (NRF). The FFG modernization improvements will assist the class in reaching its 30-year expected service life.

Program Status: The 30-ship FFG class is undergoing a modernization package that commenced in FY 2003 with USS Kauffman (FFG-59). It corrects the most significant maintenance and obsolescence issues in order to maintain the ships through their full 30 year service life. The FFG-7 modernization package includes replacement of four obsolete SSDG with COTS SSDG; obsolete evaporators with COTS Reverse Osmosis (RO) Units; and existing boat davit with COTS Slewing Arm Davit (SLAD). Other major HM&E alterations include ventilation modifications, AMR #3 AFFF Sprinkling modifications, Self-Contained Breathing Apparatus (SCBA) installation, replacement of water cooled 400 Hz converters with Air Cooled Frequency converters. Combat Systems improvements include the installation of CIWS 1B and Nulka, which will be completed earlier than scheduled (both are to be completed by FY 2006). The modernization effort is scheduled for completion by 2010.

Developer/Manufacturer: Bath Iron Works, Bath, Maine.

HSV-2
High-Speed Catamaran

Description: The HSV-2 is a high-speed experimental vessel that will carry out concept development and fleet testing in support of Navy transformation initiatives. The ship will provide an interim, partial replacement for the Mine Countermeasures Command and Support ship USS Inchon (MCS-12) that was decommissioned in 2002. HSV-X2 testing will be a key component in the development of mission modules and operating concepts for the Littoral Combat Ship (LCS), through fleet exercises and battle experiments coordinated by the Navy Warfare Development Command, Mine Warfare Command,and the U.S. Marine Corps Combat Development Command. The ship is capable of speeds in excess of 40 knots and has a shallow draft, enabling it to operate effectively in littoral areas. The vessel will be capable of launch and recovery of MH-60S helicopters, rigid hull inflatable boats,as well as unmanned off-board vehicles. (See separate program summaries for the LCS and MH-60S.)

Program Status: HSV-2 is the second modified aluminum-hulled, 319-foot commercial catamaran to be evaluated by the Navy, following successful joint-service testing with HSV-X1 Joint Venture. The Navy took delivery of HSV-2 in summer 2003, under a one-year charter with four one-year lease options, managed by the Military Sealift Command.

Developer/Manufacturer: Bollinger/Incat, Tasmania, Australia, and New Orleans, Louisiana.

LCS
Littoral Combat Ship

Description: Future Joint and Combined operations will hinge on our ability to provide assured access in the face of an unpredictable and asymmetrical threat. This has been recognized for some time;however, the events of the last few years,including the Global War on Terrorism, have brought a renewed sense of urgency to these missions. The anti-access threats challenging our naval forces in the littorals include quiet diesel submarines armed with a variety of anti-ship weapons, mines, and attacks by small surface craft. Such threats have great potential to be effectively employed by many less-capable countries and non-state actors to prevent U.S. forces from unhindered use of littoral areas. LCS, as one element of the future "surface combatant family of ships," will be optimized to defeat these anti-access threats in the littoral. It will use open-systems architecture design, modular weapons and sensor systems, and a variety of manned and unmanned vehicles to expand the battlespace and project offensive power into the littoral. Technology has now matured to the point where we can employ significant warfighting capability from a small, focused-mission warship like the LCS in support of Sea Strike and Sea Shield operations. Several focused-mission LCS mission packages are being developed that will provide capabilities critical to Sea Shield's forcible entry, sea/littoral superiority, and homeland defense missions. The ship will also possess capabilities to conduct missions supporting intelligence, surveillance, and reconnaissance

(ISR), special operations, and maritime interception and homeland defense , regardless of mission package installed . Fully self-deployable and capable of sustained underway operations from homeports to any part of the world, the LCS will have the speed, endurance, and underway replenishment capabilities to transit and operate independently with carrier strike groups, expeditionary strike groups, or expeditionary strike forces.

Program Status: The LCS is being rapidly developed using evolutionary acquisition and Spiral Development methodologies. As currently envisioned, LCS will be built in at least two flights, with the first of four Flight 0 ships slated for contract award in FY 2005, and the first Flight 1 awarded in FY 2008. The Flight 0 Seaframe – the "core" LCS system to which the mission modules connect – will build upon lessons learned and risk mitigation efforts from several Navy experimental ships, such as HSV, X- Craft, and others. Mission modules for Flight 0 will be adaptations of existing or near-term development unmanned vehicles and systems modularized for integration with the LCS Seaframe. Flight 1 modules will be spiral upgrades to the Flight 0 modules was necessary to reflect new requirements. LCS received Congressional approval in the FY 2003 Defense Authorization Act. LCS preliminary design began in July FY 2003, with the award of contracts to Industry Teams led by General Dynamics, Lockheed Martin, and Raytheon. In May FY 2004, the Navy will down-selected two efforts for Final Design, moving toward first ship delivery in FY 2007. In the spirit of Spiral Development, the LCS program will be supported by the Capability Development Document (CDD) developed to support the Milestone A decision. A second CDD will support Milestone B for Flight 1 ship construction in FY 2008. This requirements strategy supports both the streamlined acquisition and the Spiral Development strategies for LCS. The philosophy of the LCS program is to accelerate delivery of combat-capable ships to the Fleet and to rapidly apply lessons in construction and operations to enhance next-flight capabilities.

Developer/Manufacturer: Teams led by General Dynamics and Lockheed Martin.

LCU(R)
Landing Craft Utility (Replacement)

Description: The Navy has maintained approximately 35 LCUs for the past 30 years. LCUs,known as the workhorses of the Fleet, are capable of ship-to-shore and intra-theater transport of troops, equipment, and supplies, as well as independent operations for up to 10 days and 1,000 nm. Their heavy-lift capability is twice that of the LCAC, although transit speeds are much less. The active LCUs were built from 1959 to 1971, and the average LCU age is 33 years. There are currently 35 LCUs in the inventory: 33 LCU 1600-class craft in the active fleet—17 on the east coast, 12 on the west coast, and four in Sasebo, Japan—and two craft in reserve units in Tampa, Florida, and Buffalo, New York.

The current fleet of LCUs has surpassed their expected service life of 20 years. Their command, control, communications, computers, and navigation (C4N) suite and electronics are outdated and

LCU (R) ➢

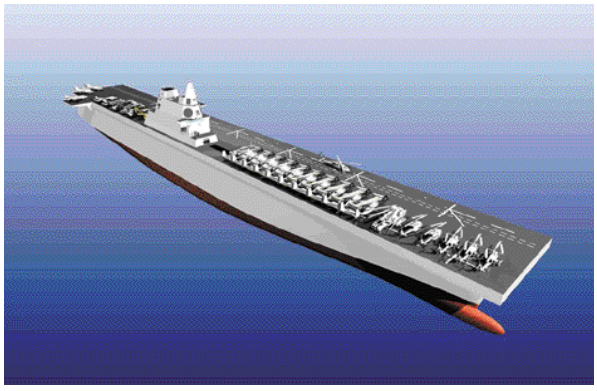
are not interoperable with other units. Because of their poor station keeping and maneuverability, LCUs are at high risk of broaching during operations. Despite this, the Navy still requires LCUs to complement the LCAC fleet, as LCACs cannot meet all of the Navy's low-end operational-logistics needs. The LCU(R) has been proposed to replace the current fleet of LCUs.

The LCU (R) will have the greatest cargo capability of any naval landing craft. Most importantly, it will be capable of operating in environmentally constrained areas and will be extremely rugged and reliable. However, similar to the current fleet of LCUs, it will remain relatively slow in comparison to the LCAC, and have limited beach accessibility. While LCACs travel at high speeds with virtually unlimited beach access, they are environmentally constrained. LCACs also carry less cargo than LCUs, operate with more limited range, and are technically complex with high-maintenance requirements. Therefore, the Navy requires both types of landing craft because no one craft can do it all. LCU(R) improvements will include a 42 percent increase in payload capacity (capable of carrying three M1A1 Abrams tanks), greatly enhanced maneuverability (which minimizes broaching by using Bow Thrusters and Integrated Bridge Systems), a modernized C4N suite (to increases capabilities and interoperability), gender-neutral berthing arrangements, reduced crew requirements, and increased speed.

Program Status: The Mission Needs Statement has been approved, and the independent Analysis of Alternatives has been completed. RDT&E, with industry participation, completed in FY 2003.

Developer/Manufacturer: There are currently more than eight shipyards competing in the Design Feasibility Study. Source selection for a manufacturer will take place in late FY 2004.

LHA(R)
General Purpose Amphibious Assault Ship (Replacement)



Description: The LHA(R) is a new acquisition program that will deliver a class of general-purpose amphibious assault ships. In support of the "Sea Power 21" global concept of operations, the LHA(R) class will provide forward-presence and power-projection capabilities as elements of U.S. expeditionary strike groups and strike forces. With elements of a Marine landing force, the LHA(R) class will embark, deploy, land, control, support, and operate helicopters, landing craft, and amphibious vehicles for sustained periods. The LHA(R) will also support contingency-response, forcible-entry, and power-projection operations as an integral part of Joint, interagency, and multinational maritime expeditionary forces.

Based on evolutionary spiral development strategy that leverages evolving technologies and systems, the LHA(R) class will replace four of the five *Tarawa*-class LHAs that begin reaching the end of their expected service lives between 2011 and 2015. LHD-8, the final ship of the *Wasp* (LHD-1) class will replace the first retiring *Tarawa* LHA class ship and will incorporate a gas turbine propulsion plant and all-electric auxiliaries. The first LHA replacement is being designed as a longer and wider variant of the LHD 8. This ship will include LHD 8 enhancements (See the LHD-1 program summary) and a significant increase in aviation lift, sustainment, and maintenance capabilities;

space for a MEB, PHIBGRU, or small-scale JTF staff; a dramatic increase in service life allowances for new-generation Marine Corps systems (MV-22, JSF, EFV); and substantial survivability upgrades. The subsequent three LHA(R) ships, which will incorporate additional spiral/incrementally developed capabilities,are being designed explicitly to provide needed lift capabilities to support the U.S. Marine Corps Mobility Triad (MV-22, LCAC,AAAV).

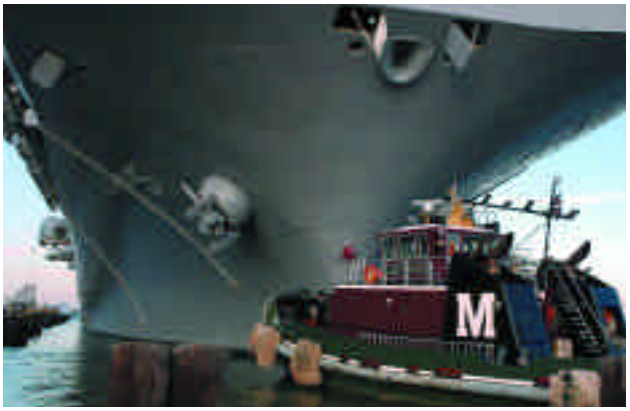
Program Status: In 1999, the Navy conducted a development of options study that ruled out LHA Service Life Extension as a viable option. The Navy and Joint Staff approved and validated the LHA(R) Mission Need Statement in March 2001, and OSD(AT&L) authorized Milestone A Acquisition status and entry into Concept Exploration phase in July 2001. Under OSD guidance, the Navy conducted an Analysis of Alternatives (AoA) to determine the best method of replacing the four remaining LHAs. This study, completed in September 2002, evaluated numerous design alternatives, including: (1) repeat LHD-8 with evolutionary modifications; (2) a longer and wider LHD-8 upgraded to operate the larger and heavier new-generation amphibious systems; and (3) several new ship designs spanning a wide range in size and capability. The Navy and Marine Corps leadership selected option (2) for the best balance in meeting: (1) operational requirements, (2) timing, and (3) affordability. Department is in the process of determining the optimal alternative for the LHA(R) based on the results of the AoA and will fund the program (both R&D and SCN) as required in the FY 2004 President's Budget. The first LHA(R) platform is currently planned for FY 2008 contract award and a FY 2013 delivery, with additional ships being acquired at three-year intervals. This extended build schedule results in the last *Tarawa*-class LHA being retired in 2023, eight years past its 35-year estimated service life.

Developer/Manufacturer: To be determined.

LHD-1
Wasp Class Amphibious Assault Ship

Description: The *Wasp* class comprises eight 40,650-ton full-load, multi-purpose amphibious assault ships whose primary mission is to provide embarked commanders with command and control capabilities for seabased maneuver/assault operations as well as employing elements of a landing force through a combination of helicopters and amphibious vehicles. The *Wasp* class also has several secondary missions, including power projection and sea control. The LHD-1 ships increase total lift capacity by providing both a flight deck for helicopters and Vertical/Short

Take-Off or Landing (V/STOL) aircraft, such as the AV-8B Harrier and the MV-22 Osprey, and a well deck for both air-cushioned and conventional landing craft. Each ship can embark 1,877 troops (surge) and has 125,000 cubic feet of cargo for stores and ammunition and 20,900 square feet for vehicles. Medical facilities include six operating rooms,an intensive-care unit, and a 47-bed ward. LHDs 5-7 are modified variants of the class, and design changes include: increased JP-5 fuel, C4ISR and self-defense improvements, fire-fighting and damage-control enhancements, and Women-at-Sea accommodations.



LHD-1 ➢

The Navy awarded the LHD-8 construction contract in April 2002. The ship has significant design changes that incorporate gas-turbine (GT) propulsion and all-electric auxiliary equipment. GT propulsion was considered for LHD-5 (keel laid in April 1991), but the technology of the time would have required four GT plants that would have significantly reduced internal volume for other vital needs. Since then, GT power-ratings have increased such that just two GTs are needed to generate the required 70,000 shaft-horsepower. (The earlier ships have two steam plants and geared turbines.) Otherwise, LHD-8 will be a modified-repeat of LHD-7 (a state-of-the-practice ship), except for changes made necessary because some older systems are no longer available.

Program Status: Seven LHDs have been delivered to the Fleet. The newest LHD, the USS Iwo Jima (LHD-7),was commissioned on 30 June 2001. The eighth ship of the class is under contract, and the Navy anticipates delivery of LHD-8 in FY 2007.

Developer/Manufacturer: Northrop Grumman Ship Systems, Pascagoula, Mississippi.

LPD-17
San Antonio Class Amphibious Transport Dock Ship

Description: The LPD-17 is an amphibious transport dock ship optimized for operational flexibility and designed to meet Marine Air-Ground Task Force lift requirements in the emerging Expeditionary Maneuver Warfare concept of operations. The San Antonio-class is a medium-sized ship 684 feet in length, with a beam of 105 feet, a maximum displacement of 25,000 long tons, and a crew of approximately 360. Four turbocharged diesels with two shafts and two outboard-rotating controllable-pitch propellers will generate a sustained speed of 22-plus knots. Other ship characteristics include 25,000 square feet of space for vehicles (more than twice that of the Austin-class LPDs), 34,000 cubic feet for cargo, accommodations for approximately 720 troops (800 surge), and a medical facility (24 beds and three operating rooms—one medical and two dental). The aft well deck can launch and recover traditional surface assault craft as well as two landing craft air cushion vehicles, capable of transporting cargo, personnel, Marine vehicles and tanks, and the Marine Corps' new Expeditionary Fighting Vehicle (EFV). The LPD-17 aviation facilities include a hangar and flight deck (33 percent larger than *Austin*-class) in order to operate and maintain a variety of aircraft, including current and future rotary-wing aircraft. Other advanced features include the Advance Enclosed Mast / Sensor (AEM/S) for reduced signature/sensor maintenance, reduced-signature composite-material enclosed masts, other "stealth" enhancements, state-of-the-art C4ISR and self-defense systems, a Shipboard Wide-Area Network (SWAN) that will link shipboard systems and embarked Marine Corps platforms in a virtual "information superhighway," and significant Quality of Life improvements.

Reducing Total Ownership Costs has been and will remain an important factor in the program's efforts. By introducing a variety of new approaches to streamlining the acquisition process and taking advantage of numerous "SmartShip" initiatives to optimize

(not simply reduce) manning through focused human-factors engineering and thus enhance operational capabilities, the Navy estimates that it shaved about $4.5 billion from the program's total ownership cost. Manning and human-systems integration issues are absolutely essential, as some approximately 40 percent of a ship's life cycle,cradle-to-grave cost is directly linked to its crew.

In conjunction with the *Tarawa* (LHA-1)-class, *Wasp* (LHD-1)-class, LHA Replacement [LHA(R)]-class amphibious assault ships, and the 12 Landing Ship Docks (LSDs), the Navy will have the foundation for meeting the lift requirement of 2.5 Marine Expeditionary Brigade Assault Echelons (MEB AE); the 12 Expeditionary Strike Group (ESG) equivalents are required to sustain near-continuous forward deployment of three Marine Expeditionary Units (Special Operations Capable) (MEU SOC). Without the 12 LPD-17s, however, the vehicle lift capability will degrade to at most 2.1 MEB-equivalents.

Program Status: Initial contract award to design and build the lead ship of the class was awarded to the Avondale-Bath Alliance in December 1996. A contract award protest was successfully resolved in April 1997. LPD-17's keel was laid on 9 December 2000, and delivery is expected in December 2004 (FY 2005). LPD-18 started construction on 18 February 2002, and the keel was laid on 14 October 2002. Following the transfer of LPD-17 class workload from Bath Iron Works to Northrop Grumman Ship Systems (NGSS) in June 2002, LPD-19 restarted construction at NGSS in Pascagoula on 19 August 2002, and the keel was laid in November 2002. LPD-20 started construction in March 2003 with the keel laid on 26 August 2003. LPD-21's (the fifth ship of the class) contract awarded construction in February 2004.

Developer/Manufacturer: Northrop Grumman Ship Systems Avondale Operations, New Orleans, Louisiana, and Ingalls Operations, Pascagoula, Mississippi; Raytheon, San Diego, California; and Intergraph, Huntsville, Alabama.

MPF(F)
Maritime Prepositioning Force (Future)

Description: Current MPF ships have limited interoperability with naval shipping and cannot provide direct and continuous sustainment after ship-offload. Today's MPF ships offload at a port or across a beach, and equipment is married with Fly-in Echelon (FIE) personnel and equipment from shore based Marine Expeditionary Units or Brigades (MEUs/MEBs). In order to meet future "Sea Power 21" sea-basing needs, the Navy and Marine Corps have proposed either converting existing maritime ships or acquire new, more effective vessels to serve as sea bases in support of expeditionary and carrier strike groups. Compared to the current MPF fleet, MPF(F) will have additional capabilities to satisfy ship-to-objective-maneuver (STOM) and operational maneuver…from the sea (OMFTS) mission requirements, including:

- **Selective off-load, which will enable Marine Expeditionary Brigades to select equipment tailored for specific STOM and OMFTS missions**

MPF(F) ➢

- **The ability to form a Maritime Prepositioning Group (MPG) as part of the sea base in support of expeditionary and carrier strike group operations**
- **The capability to provide joint sustainment in direct support of joint forces tasked with STOM and OMFTS tasks**
- **The capability to reconstitute in the Joint Operations Area (JOA) and to redeploy directly to another JOA**

MPF(F)s will provide operational and logistical support from the sea for Marines and Joint forces ashore as well as naval forces afloat. Optimizing seabased capabilities will significantly reduce assured-access and sovereignty challenges by reducing footprint ashore. MPF(F)s will transform the MPS-supported Marine Expeditionary Brigade of today from a fighting unit only effective once ashore to one that can operate continuously from a sea base without the need to transition support elements to the land. MPF(F) will also support rapid reconstitution and redeployment for follow-on missions.

MPF(F)'s transformational characteristics include significant improvements in force closure, sustainment, selective offload, command and control,and reconstitution. MPF(F) will be interoperable with current amphibious task force shipping via surface transport (LCAC and/or LCU), underway replenishment stations, and compatible C4I systems. MPF(F) has the potential to support joint operations and will be interoperable with joint forces support capabilities.MPF(F) will transform naval logistics into a seamless and integrated system that will complement current Combat Logistics Forces by providing seabased logistics to all naval forces. This ability could include cargo transshipment from intermodal shipping to other naval ships or ashore. While independent forcible entry is not a mission envisioned, MPF(F) will be able to support directly a committed expeditionary strike group and apply forces directly where required.

Program Status: On 5 December 2002, OSD(AT&L) signed the Milestone A document and stated that OSD's Alternative of Analysis guidance would start that month. Depending upon the AoA results, potential production schedule would be as many as two ships per year up to a maximum of 12-18 ships, beginning with a lead ship in 2008.

Developer/Manufacturer: To be determined following completion of the AoA.

T-AKE
Lewis and Clark Class Dry Cargo and Ammunition Ship

Description: The Dry Cargo and Ammunition Ship is being developed to replace the *Kilauea* (T-AE-26), *Mars* (T-AFS-1),and *Sirius* (T-AFS-8) classes of fleet auxiliaries, all of which are nearing the ends of their service lives. T-AKE will provide logistic lift from sources of supply and will transfer this cargo at sea to station ships (which serve the combat forces) and other naval forces. As a secondary mission, T-AKE may act in concert with a fleet oiler (T-AO) as a substitute station ship. T-AKE ships will be built to commercial standards and crewed by Military Sealift Command civilian mariners,augmented by military personnel as

required by mission requirements, such as support cargo supply functions.A Navy aviation detachment or equivalent, using contracted commercial helicopters, will conduct vertical underway replenishment (VERTREP) operations.

Program Status: The construction of the first of 11 T-AKEs began on 22 September 2003. Four ships have been awarded through the end of December 2003, and contracts for the two ships funded in FY 2004 are expected to be awarded mid-year. The T-AKE program is designated a Navy-led ACAT 1C program.

Developer/Manufacturer: National Steel and Shipbuilding Company, San Diego, California.

T-AOE(X)
Next-Generation Fast Combat Support Ship

Description: The Fast Combat Support Ship is being developed to replace the Sacramento class of fleet auxiliaries that are nearing the ends of their service lives. T-AOE(X) will provide rapid replenishment at sea of petroleum, munitions, provisions, and fleet freight in its role as a station ship. T-AOE(X) ships will be built to commercial standards and will be crewed by Military Sealift Command civilian mariners, augmented by military personnel as required by mission requirements, such as support cargo supply functions. Vertical underway replenishment (VERTREP) operations will be conducted by a Navy aviation detachment or equivalent contracted commercial helicopters. The Commander Fleet Forces Command requires aligning the carrier strike group with a dedicated T-AOE, citing advantages compared to a T-AO/T-AKE pair in a station-ship role,including a significant reduction in alongside time (a triple-product ship reduces alongside time by as much as 45 percent), increased speed of 26+ knots enhances responsiveness, and increased level of survivability by reducing escort requirements.

Program Status: The Navy Requirements Board endorsed the Mission Need Statement showing the requirement for four T-AOE(X). In accordance with the new Joint Capabilities Integration and Development System, in early 2004 an Initial Capabilities Document was in review for approval by both the Navy and Joint Staff. Acquisition is currently programmed to start in FY 2009.

Developer/Manufacturer: To be determined.

Equipment and Material

COLDS
Cargo Offload and Discharge System

Description: The Cargo Offload and Discharge System includes the Cargo Offload and Transfer System (COTS) for dry cargo and the Offshore Bulk Fuel System (OBFS) for liquid cargo. COLDS supports Logistics-Over-The-Shore (LOTS) operations—the loading and unloading of Marine Corps Maritime Prepositioning Force (MPF) and Assault Follow-On Echelon (AFOE) ships-in the absence of established port facilities.

COLDS ➢

Program Status: Routine replacement of these heavily used assets maintains LOTS readiness. After the Army withdrew from development and acquisition of a sea-state-three-capable Joint Modular Lighterage System (JMLS), the Navy leveraged research and development technology from the JMLS program to procure a replacement system called the Improved Navy Lighterage System (INLS) which is required to replace less capable, older assets. This system will support current MPF operations until the Navy replaces these ships with MPF Future assets. Ongoing research and development efforts to provide increased operational LOTS capability include development of new Navy lighterage-multiple projects for shipboard cranes and various critical elements of the LOTS system-of-systems. Prototype testing on INLS and associated subsystems was completed in FY03. The Navy awarded the contract for INLS low-rate production in FY 2003 with delivery scheduled for FY 2005.

Developer/Manufacturer: Marinette Marine of Marinette,WI for INLS System, Oldenburg of Lakeshore, WI for side connectors.

Naval Aviation CBRND
Improved Naval Aviation
Chemical Biological Radiological Nuclear Defense

Description: The Naval Aviation CBRND program is part of a joint-service effort to provide the warfighter with the means to sustain flight operations during the threat or use of chemical and biological (CB) weapons of mass destruction. Naval Aviation is the lead service for a lighter-weight protective coverall called JPACE—Joint Protective Aircrew Ensemble—that provides percutaneous protection from CB warfare agents. Additionally, Naval Aviation is participating in several joint CBRND developmental and acquisition programs that will provide the capability for in-flight automated point and standoff detection of chemical agents, as well as fielding solutions and applicators to restore aviation assets by thorough decontamination of aircrew personnel, aircraft, and sensitive equipment. Naval Air Systems Command updated the preliminary version of the CBRND NATOPS (Naval Aviation Training and Operating Procedures Standardization) Manual in November 2003. Following fleet validation/verification exercises, the formal CBRND NATOPS Manual will be promulgated by the end of FY 2004. Policy and training guidance for Naval Aviation CBRND is being developed and incorporated in a CBRND NATOPS (Naval Aviation Training and Operating Procedures Standardization) Manual.

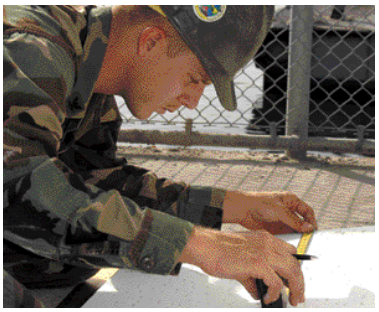
Program Status: JPACE MS B was approved February 2002,and the Navy awarded two competitive SDD contracts in March 2002. The JPACE successfully completed its Critical Design review planned for April 2003,as well as developmental and operational testing (DT/OT) scheduled to commence in September 2003. Milestone C,allowing approval for production,is planned for the first second quarter FY 2005.

Developer/Manufacturer: Creative Apparel Associates, Belmont, Maine., and Tennessee Apparel Corporation, Tullahoma, Tennessee.

NMCB TOAs
Naval Mobile Construction Battalion Tables of Allowance

Description: In war time, Naval Mobile Construction Battalions (NMCBs) and other

Naval Construction Force (Seabees) elements provide key engineering and construction support to Marine-Air-Ground Task Forces (MAGTF). In support of Sea Strike and Sea-Basing missions, the Navy-Marine Corps Team projects power from the sea with a rapid flow of maneuver forces ashore using roads, expeditionary airfields, force-protection structures,intermediate staging bases, and advanced logistics bases. Forward deployment of NMCBs enables the surge of task-tailored engineer forces and equipment sets to support the MAGTF and other naval and joint forces on land. In peacetime, forward-deployed NMCBs conduct humanitarian-assistance and disaster-recovery operations, participate in foreign-engagement exercises, and complete construction projects that support sustainment, restoration, and modernization of the Navy's forward bases and facilities.



Program Status: The Navy has developed a long-range plan to recapitalize the Tables of Allowance (ToA) of all Seabee units. The initial priority is to correct existing inventory shortfalls. During the next several years,the ToAs will be outfitted with modern and recapitalized tactical vehicles, construction and maintenance equipment, communications gear, infantry items, and field support equipment.

Developer/Manufacturer: Multiple sources.

Submarine Survivability

Escape, and Rescue Survivability

Description: Today's submarine sailors use passive means to remove carbon dioxide from the disabled submarine's atmosphere enabling survival up to seven days. Current development includes improving passive scrubbing capability with higher-density scrubbing technologies.

Program Status: Passive scrubbing curtains are being installed on all submarines by FY 2005. Extend-Air cartridges are to be installed on the *Virginia* (SSN-774)-class submarines.

Developer/Manufacturer: Battelle Memorial Institute, Columbus Ohio; Micropore, Newark, Delaware.

Escape

Description: To facilitate emergency escape from depths down to 600 feet,all submarines are being outfitted with the Mark 10 SEIE (Submarine Escape Immersion Equipment) Suit and improved hatch-operating systems. In addition to increasing the depth capabilities of escape, the suit provides thermal protection and individual life rafts for surface abandonment or escape.

Program Status: In production.

Developer/Manufacturer: Beaufort Air-Sea Equipment, Merseyside, United Kingdom.

Rescue

Description: The Navy's Deep Submergence Rescue Vehicle (DSRV) and Submarine Rescue Chamber (SRC) provide the service's current capabilities for submarine rescue. These systems are designed for quick deployment in the event of a submarine accident. They are transportable by truck, aircraft, ship, and, for the DSRV, by specially configured "mother" submarines. The Navy is developing a new rescue system called the Submarine Rescue Diving Recompression System (SRDRS). SRDRS is a manned submersible capable of rapid, worldwide deployment on vessels of opportunity. The SRDRS overcomes a significant deficiency of current systems enabling personnel transfer under pressure and decompression of submarine disaster survivors. SRDRS will be a government-owned contractor-operated system, and will provide increased capability at reduced costs compared to legacy rescue systems.

Program Status: Critical design review for the SRDRS rescue vehicle is expected in FY 2003, with full production expected shortly thereafter. The SRDRS will be rescue-ready in early FY 2006, and transfer under pressure capable in late FY 2006.

Developer/Manufacturer: OceanWorks International, Vancouver, California;Oceaneering International, Upper Marlboro, Maryland; Southwest Research Institute, San Antonio, Texas.

FORCEnet

FORCEnet is the "glue" that links Sea Strike, Sea Shield, and Sea Base in a complex web of secure communications and information. Anticipated naval operations in the Information Age characterize how the Navy defines future requirements, develops systems, and delivers combat power to the warfighter. The Navy continues to evaluate operational concepts for Information-Age naval operations that articulate the service's shift from platform-centric operations to Net-Centric Operations (NCO). The NCO concept is the organizing principle for future Navy forces, focusing on information technology to network warfighters together, not just to create nets.NCO derives power from rapid and robust networking of well-informed, geographically dispersed warfighters that will enable an overpowering tempo and a precise, agile style of maneuver warfare. Using effects-based operations, the aim is to sustain access and decisively to impact events ashore. Although NCO addresses the operational and tactical levels of warfare, it affects all levels of military activity—from the tactical to the strategic. It is the emerging theory of war for the Information Age.

The Navy has embarked on a strategic direction to deliver revolutionary combat capabilities within the Network-Centric Warfare (NCW) framework. The desired future state is to lead the Navy into the information age by applying the principles of NCW to leverage the power of shared information and knowledge delivering end-to-end combat capabilities spanning all operational regimes,from space to the seabed. The Navy's FORCEnet concept embodies all attributes of NCO in the context of a modest expansion of naval force structure but a significant increase in operational capabilities.

FORCEnet is the Navy's transformation accelerator and alignment agent for emerging Navy transformational concepts ensuring maritime power projection enabled by forward presence and knowledge superiority. As an organizing transformational change agent for Navy network-centric capability development,FORCEnet will define a set of standing force modules with specified capabilities, response times, readiness standards, and a system of verification.

FORCEnet will enable requirements alignment for legacy command and control systems interoperability to ensure shared situational knowledge across Navy and joint forces in an NCW environment.

The FORCEnet concept encapsulates architectures and building blocks of sensors,networks,decision aids, weapons, warriors, and supporting systems integrated into a highly adaptive, human-centric, comprehensive system that operates from seabed to space, from sea to land. By exploiting existing and emerging technologies, FORCEnet enables dispersed human decision-makers to leverage military capabilities to achieve information dominance across the entire mission landscape with joint, allied, and coalition partners. FORCEnet is not a single system or program; it is an architecture that comprises networked systems, processing and computing, and interfaces that are secure and transparent to the warfighter.

Joint Service/Navy-Wide Systems

ADNS
Automated Digital Network System

Description: The Automated Digital Network System is the system responsible for the transport of all Wide Area Network (WAN) IP services which connect afloat units to the various global shore sites. It provides ship and shore Internet Protocol (IP) connectivity and promotes the efficient use of available satellite and line of sight communications bandwidth.ADNS is engaged in converging all voice, video, and data communications between ship and shore to an IP medium taking full advantage of all RF means aboard ship to transmit data efficiently. Specifically, it automates the routing and switching of tactical and strategic C4I data via Transmission Control Protocol/Internet Protocol (TCP/IP) networks linking deployed battle group units with each other and with the Defense Information Systems Network (DISN) ashore. ADNS uses Commercial Off-the-Shelf (COTS) and Non-Developmental Item (NDI) Joint Tactical Architecture (JTA)-compliant hardware (routers, processors, and switches), and commercial-compliant software in a standardized,scalable,shock-qualified rack design.

Program Status: Two hundred and fifty-two shipboard and eight shore sites (Network Operations Centers) have been fielded through FY 2002. Afloat installations include amphibious ships, carriers, cruisers, command ships, destroyers, and frigates. The shore installations of multiple ADNS nodes have been fielded at the four major sites supporting Surface Ship Operations (NCTAMS LANT, EURCENT, PACIFIC, and at NCTS Bahrain) and at the four major sites supporting Submarine Afloat Communications (Broadcast Control Authority Sites at LANT, PAC, COMSUBGRU Eight in Italy, and COMSUBGRU Seven in Japan). Plans for FY 2003 include accomplishing 52 additional Shipboard Installations and the accomplishment of a tech refresh at all the major shore installations. This will be in accordance with the fleet commanders' coordinated IT21 fielding plans. Fielding plans for FY 2004 and beyond include the CISCO router replacement plan, the submarine variant that will include the shore BCA, fielding of the SCN-variant, and determination and fielding of a new baseband system. Plans also call for technology integration of Quality and Class of Service (QoS/CoS) with either new router templates or implementation of a "Packet Shaper" technology.

Developer/Manufacturer: SPAWAR Systems Center San Diego, Code 2631 with integration support from Science Applications International Corporation, Arlington, Virginia. Primary Vendor: Cisco.

ATDLS
Link-11/16/22 Advanced Tactical Data Link Systems

Description: The ATDLS program develops, fields, and supports joint and coalition Tactical Data Link (TDL) capabilities. These Joint TDLS include terminals, gateways, networks, and support initiatives that improve TDL connectivity, promote equipment commonality and interoperability, and provide training and fleet support. Link-11 is used by Navy, Air Force, Army and allied ships

and aircraft, many of which are also equipped with Link-16. In accordance with the Joint Tactical Data Link Management Plan (JTDLMP),Link 11, which uses the M-series message standard,is scheduled to be shut down no later than 2015. Link 16, which uses the J-series message standard, has been designated as the DoD primary Tactical Data Link. The Navy is implementing Link 16 in most of its link-capable platforms. As the JTDLMP approved replacement for Link 11, Link-22 is a multi-national development effort and will use the J-Series message standard. Major supported efforts are as follows:

- **Terminals: Joint Tactical Information Distribution System (JTIDS), Multifunctional Information Distribution System (MIDS) Low Volume Terminal (LVT),MIDS Joint Tactical Radio System (JTRS),and the Common Shipboard Data Terminal Set (CSDTS)**
- **Gateways: Command and Control Processor (C2P), Common Data Link Management System (CDLMS), Next Generation C2P, and Common Link Integration Processing (CLIP)**
- **Support Initiatives: Joint Interface Control Officer (JICO) Support System (JSS), Dynamic Network Management (DNM)**

These capabilities allow more effective employment of fleet units by improving timeliness, accuracy, and content of tactical data transfer.

Program Status: See individual program summaries for Command and Control Processor, Common Data Link Management System, Common Link Integration Processing, Joint Interface Control Officer Support System, Dynamic Network Management,and Link 22.MIDS-LVT completed OPEVAL and reached IOC in the F/A-18 Hornet in FY 2003.

Developer/Manufacturer: GAC, Valley Forge, Pennsylvania; Logicon, San Diego, California; and Rockwell International, Dallas, Texas.

C2P
Command and Control Processor

Description: The Command and Control Processor serves as the interface and the data translator between the surface platform's Combat Direction System (CDS) and the Data Links. It is also the data forwarder between the Links. In 1984, implementation of JTIDS/Link 16 based CDSs commenced with the Advanced Combat Direction System (ACDS) Model 5. The ACDS Model 5 contract had an option for development of a C2P to provide the functionality of the TDL Communication Processor. Also in 1984, the Operational Requirement (OR) for the C2P was established. The operating program of AN/UYQ-62 (V), the initial C2P variant, was coded in CMS-2 and hosted in a single AN/UYK-43. When development of ACDS Model 5 was delayed, the C2P was modified to support Model 4 (Link 11) based surface platforms. This allowed installation of C2P and JTIDS/Link 16 aboard Model 4 AEGIS and ACDS Block 0 ships. In addition to the purposes and functions stated above, C2P provides data

C2P ➢

forwarding between Link 11 and Link 16. With this capability, C2P serves as a gateway to connect a Link 16 network to a legacy Link 11 network. C2P Model 4 successfully completed OPEVAL in a combined test with Link 16 in FY94.C2P Model 5 successfully completed OPEVAL in FY00. The approaching obsolescence of the C2P computer brought about the need to identify a suitable hardware set to re-host the functionality of the C2P. As a practical and cost-effective option,the C2P Re-host (C2P (R)) initiative was joined with another initiative that encompassed the concept of co-locating multiple tactical link management, coordination, and monitoring in a single host.

Program Status: The C2P is fully fielded with the capability being re-hosted as software within the Common Data Link Management System and Next Generation C2P.

Developer/Manufacturer: GSA/Anteon, Fairfax, Va., DRS Inc., Wyndmoor, Pa.

CDLMS
Common Data Link Management System

Description: The CDLMS initiative extends the functionality of the C2P by consolidating several functions previously performed by separate systems or subsystems, and providing improved Human Machine Interface (HMI) and Link maintenance. CDLMS also incorporates the Link Monitoring System (LMS) along with supporting the initial phase of development of the Common Shipboard Data Terminal Set (CSDTS). The CSDTS initiative provides the next generation Link 11 data terminal replacing legacy Link 11 terminal hardware while incorporating Multi-Frequency Link 11 (MFL), Satellite Link 11, and supporting the initial Dual Net Link 11.

Re-hosting the C2P within CDLMS provides the same functionality in COTS hardware, namely the AN/UYQ-70 console, which makes the system easier and less expensive to upgrade. The CDLMS integrates the CSDTS and C2P (R) in a set of VME cards to provide consolidated displays and controls to monitor multi-TDL networks simultaneously. The CDLMS/ C2P (R) program has fielded the AN/USQ-86 (V), consisting primarily of an AN/UYQ-70 EPS housing four VME chassis. Three of these are populated with VME card sets for the following: C2P (R), CSDTS, and the Link Management/ Monitoring Component. This hardware configuration supports the transformation to Next Generation C2P (NGC2P), which conceivably will take the place of the current C2P(R). CDLMS has successfully completed AEGIS and SSDS Combat System Integration and Test (CSIT) and is currently being installed.CSDTS implementation is ongoing, enabled by, but separate from,CDLMS/ C2P (R).

Program Status: CDLMS is being fielded.

Developer/Manufacturer: Backfit, GSA/Anteon, Fairfax, Virginia, and DRS Inc., Wyndmoor, Pennsylvania. Forward Fit, to be determined.

Challenge Athena
Commercial Wideband Satellite Communications

Description: Challenge Athena is part of the Navy commercial wideband satellite program (CWSP). It is a full-duplex, high data-rate communications link that operates in the C-band spectrum up to 2.048 Mbps. The Challenge Athena terminal (AN/WSC-8(V)1,2) with modifications by the developer/manufacturer is also capable of operating in the Ku-band spectrum. Because of open ocean limitations,there are currently no plans to enhance Navy's commercial satellite terminal to include Ku coverage. CWSP is capable of providing access to voice, video, data and imagery circuit requirements. It supports fleet commander flagships (LCC/AGF), aircraft carriers (CV/CVN), amphibious ships (LHA/LHD/LPD) and other selected ships, including hospital ships (T-AH) and submarine tenders (AS). Terminals are also installed at schoolhouse locations in San Diego, California, and Norfolk, Virginia. Examples of specific communications circuits that are provided include: Joint Service Imagery Processing System–Navy/Concentrator Architecture (JSIPS–N/JCA), Naval and Joint Fires Network (NFN), Video Tele-Conferencing (VTC), Video Information Exchange system (VIXS), Video Tele-Medicine (VTM), Video Tele-Training (VTT), Afloat Personal Telephone Service (APTS), Automated Digital Network System (ADNS), Integrated Digital Switching Network (IDSN) for voice/telephone, Secret/Unclassified Internet Protocol Router Networks (SIPRNET/NIPRNET), and Joint Worldwide Intelligence Communications System (JWICS). The CWSP terminal uses commercial satellite connectivity and COTS/NDI Equipment. It has transitioned from augmentation, to surge, and in recent years has become an integral part of Navy's SATCOM architecture because of the existing and extremely overburdened military satellite communications systems.

Program Status: The majority of CWSP terminals procured have been installed on approximately 32 ships and two others in schoolhouses. Six additional terminals are pending installation on new ships construction (CVN and LPD). Concurrent with this effort is the extension of medium data-rate (up to 128Kbs) connectivity to other accompanying surface warships, amphibious assault ships, and logistics support ships via a battle group IT21 wide-area network that will eventually provide these capabilities to most all Navy ships. Commercial leasing options for satellite capacity continue to be evaluated. The program office is considering options to replace or refurbish the aging CWSP (WSC-8) terminals.

Developer/Manufacturer: Various COTS/NDI.

CLIP
Common Link Integration Processing

Description: The Navy and Air Force have jointly entered into the Common Link Integration Processing (CLIP) initiative. CLIP is envisioned as an Open Architecture software-based common TDL message processing and integration capability with applications across various military platforms and installations,

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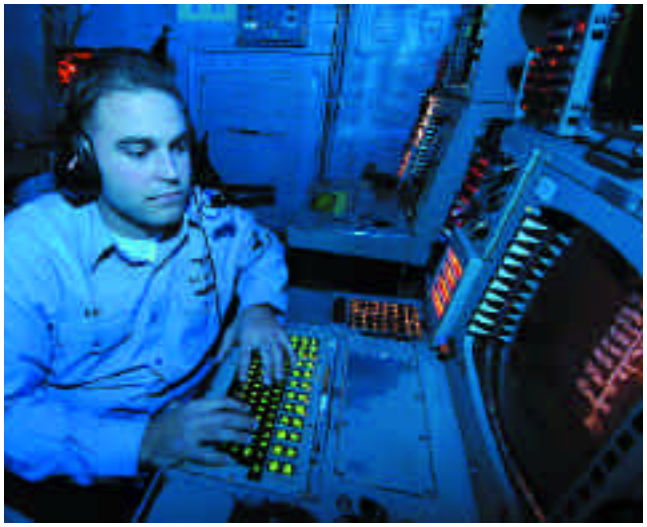
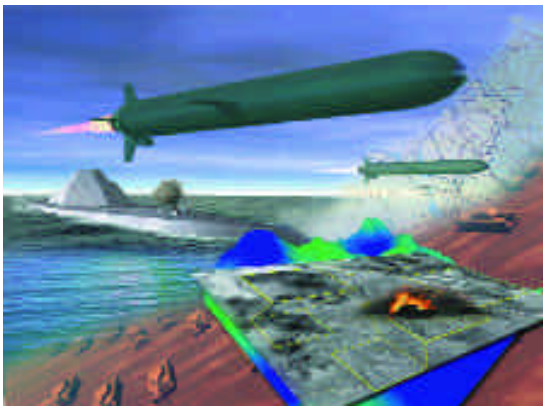
CLIP ➢



including air, surface, C2 shore sites, and ground-based tactical units. A chief objective is to provide greater interoperability and reduce implementation cost. CLIP will be an evolutionary spiral development process with functionality specified at each delivery point to match platform TDL requirements. It will provide the interface to all the various communication systems including current terminals and radios and those under development such as JTRS. It will act as a gateway providing translations and data forwarding to legacy systems and be the primary interface to any host system (i.e. combat).CLIP is envisioned to be primarily software that can reside on any operating system or hardware.

Program Status: A CLIP MOA between PEO-C4I & Space and USAF Electronic Systems Center was signed in August 2003. An Acquisition Documentation Package including an Acquisition Strategy (AS), Acquisition Program Baseline (APB) and an ACAT designation letter for the proposed ACAT II program is currently in staffing at PEO-C4I & Space and will be forwarded to ASN (RD&A) for approval. An RFP is scheduled for release in March 2004 with contract award projected in June 2004.

Developer/Manufacturer: To be determined.



DCGS-N
Distributed Common Ground/Surface System - Navy

Description: DCGS-N is the Navy's end-to-end architecture for Time-Critical Targeting (TCT)/Time-Critical Strike (TCS), merging ISRT (Intelligence, Surveillance, Reconnaissance, and Targeting), mission planning, and situational-awareness functions. Leveraging SPAWAR, NAVAIR, and NAVSEA programs, it includes timely interfaces to sensors and precision guided weapons systems. The foundation of the Navy's DCGS architecture will be the DCGS Integration Backbone (DIB). Key multi-INT exploitation and targeting functionalities of two existing ISR programs, JSIPS-N (Joint Service Imagery Processing System-Navy) and the Tactical Exploitation System (TES-N), will reside on this DIB foundation. The DIB is a product of the USAF DCGS 10.2 development effort and will provide common services and tools that ASD AT&L has mandated for use in all Service DCGS systems. The multi-Service DIB will be use commercial J2EE standards, enabling Joint interoperability.

Program Status: A total of 34 systems are currently planned for installation between FY 2005 and FY 2010 on aircraft carriers, large deck amphibious ships,fleet command ships,and designated shore-based reach back support sites. Fleet Forces Command and OPNAV are working together to determine the appropriate afloat/shore-based architecture and fielding plan that will meet fleet ISR exploitation and targeting requirements. OPNAV (N61R) is the DCGS-N Warfare Sponsor and Resource Sponsor. DCGS-N development will emphasize interoperability with all of the other Service DCGS architectures.

Developer/Manufacturers: Multiple sources.

DJC2
Deployable Joint Command and Control Capability

Description: DJC2 is a joint service DoD transformation initiative, with Navy as lead component, to provide a deployable Command and Control (C2) capability for Regional Combatant Commanders (CoComs) and Joint Force Commanders (JFCs). The purpose of DJC2 is to acquire a standardized deployable C2 capability for each Regional Combatant Commander (RCC) and JFC that greatly reduces the ad-hoc nature of Joint Task Force (JTF) C2 and represents the material solution (hardware/software) to accompany a Standing JTF Headquarters. DJC2 will provide the JFC with integration (of the myriad of C2 applications) that currently only exists for the Component Command (and below) headquarters. Communications will be provided by theater communications (e.g., Joint Communications Support Element) for the fully deployed system. DJC2 will build upon the Global Command and Control System—Joint (GCCS-J), the Joint Forces Command (JFCOM)-developed Collaborative Information Environment (CIE) Toolkit and existing Joint and Service C2 programs (especially the GCCS Family of Systems), and lessons learned from Operations Enduring Freedom and Iraqi Freedom, to equip the RCCs and JFCs with a tested C2 system that is:

- **Horizontally and vertically integrated across all levels of command**
- **Interoperable across joint, coalition,interagency, Non-Governmental Organization/Private Volunteer Organization (NGO/PVO) realms**
- **Robust,scalable, and rapidly deployable, including an en-route capability**

Spiral development and fielding of evolving technology will help to meet RCC and JTF needs. The first step will be compilation and review of all ongoing C2 efforts including Science and Technology (S&T) initiatives, Advance Concept Technology Demonstrations (ACTDs), programs of record, and fielded capabilities.

Program Status: The JROC validated the DJC2 Mission Need Statement (MNS) in February 2002. DJC2 received Milestone A approval in May 2002. The Analysis of Alternatives was completed in July 2003 and the Operational Requirements Document (ORD) approved by the Joint Requirements Oversight Council (JROC) in September 2003. The Navy plans to acquire the developmental experimentation suite for Joint Forces Command in FY 2004. The initial operational DJC2 delivery will be to the Pacific Command in FY 2005, followed by a delivery to the Central Command,intended to provide a tech-refresh to the CENTCOM Deployable Headquarters (CDHQ) in FY 2005. Other planned DJC2 deliveries are: European Command, FY 2006; Southern Command,FY 2007; and a maritime variant in FY 2009.

Developer/Manufacturer: Increment 1, based on GCCS-J, is being integrated by the DJC2 Joint Program Office, Panama City, Florida. DJC2 Increment 2 (based on the new JC2 capability) developer/manufacturer is to be determined.

DMS
Defense Message System

Description: The DMS initiative is an Office of the Secretary of Defense (OSD)-mandated program designed to eliminate the multitude of expensive stovepipe legacy record messaging systems that provide organizational and individual message traffic between operational units. The DMS architecture has been derived using the MROC (Multi-command Required Operational Capability) requirements, and has been targeted to provide the Armed Services and agencies with a high assurance messaging capability. The DMS provides messaging, directory, and management services.

Program Status: Current DoD implementation of DMS closed the DMS Transitional Hubs (DTHs) for GENSER, non-EAM messaging, on 30 September 2003. The EAM Hybrid Solution is in concurrent operations, and once fully operational will allow full DTH closure by 1 March 2004. Future implementations are in support of Directory Security Enhancements, Embarkable messaging support and DISA developed maintenance releases.

Developer/Manufacturer: Lockheed Martin, Manassas, Virginia.

Dynamic Network Management (DNM)

Description: Today's Link 16 network management system requires a very tedious network design process and has little flexibility in its use. The current network design processes are limited to a handful of experts and require an extensive knowledge of the Link 16 Time Division Multiple Access (TDMA) structure, platform capabilities and limitations, and architecture requirements. Once the network designs are distributed, they cannot easily be modified. The only changes that can occur are the choice of options within the network and require the platforms to go offline to change their options. Within these designs, Link 16 bandwidth capacity is distributed to each user by way of allocating fixed time slots to platforms and function.Once the time slots are allocated,they cannot be reallocated or redistributed to other platforms or used for other functions.

DNM will correct these limitations and provide the warfighter greater flexibility in the use of Link 16. It will facilitate automated net entry/exit of additional platforms in the future, including smart weapons with a Weapons Data Link (WDL) and will also provide a real-time capability to modify Link 16 network parameters with existing messages to meet evolving changes in the theater. DNM will also enable capabilities such as IP over Link 16, variable update and throughput rates, monitoring and analyzing real-time network loading, and executing stacked and multi-net operations.

DNM is essential to reducing Link 16 Network saturation and is an enabler for JSS. It is also essential for support of time critical targeting and time critical strike.

Program Status: DNM - USAF plans to award contracts for JICO Support System (JSS) Block 1, which incorporates DNM technology, in June 2004 to two vendors followed by a down-select to a single vendor in December 2004. Initial JSS Block 1 is planned for shipboard testing in late 2005. The DNM program will

enable a fully tested and interoperable version of the platform's host system, known as the Joint Host Demand Algorithm (JHDA), in the shipboard Command and Control Processor (C2P) in early FY 2006.A random access mode which provides a nodeless,flexible,and scalable means of adapting the network to rapid changes in topology and message traffic conditions,known as SHUMA, is currently being lab tested, and a decision on further implementation will be made at the end of FY 2004.

Developer/Manufacturer: SPAWARSYSCEN San Diego, California,and Northrop Grumman, San Diego, California

DoD Teleport

Description: Department of Defense Teleport is an initiative to provide tactical users a worldwide communications interface between the space segment and the shore infrastructure across multiple RF (radio frequency) media (military and commercial bands). Teleports will provide inter-theater reachback into the Defense Information Support Network (DISN) and intra-theater communications support for tactical users. The Navy operates and maintains three of the six identified major Teleport sites (Lago Patria, Italy; Wahiawa, Hawaii; Northwest, Virginia; the non-Navy Teleport sites are Fort Buckner, Okinawa; Camp Roberts, California; and Landstuhl-Ramstein, Germany).

Program Status: In May 2000, the Office of the Secretary of Defense selected the Defense Information Systems Agency (DISA) as the Executive Agent. The Joint Requirements Oversight Council approved the DoD Teleport ORD and architecture in July 2000. It is an ACAT 1AM program reporting to ASD (C3I) for Milestone Decision Authority and received congressional new start approval in September 2001. A decision to forego a Milestone A decision and press forward with a Milestone C (Production/deployment) was pursued and approved by ASD (C3I) on 15 April 2002.

Developer/Manufacturer: Teleport is an integration of existing Standardized Tactical Entry Point (STEP) sites.

Navy EHF/AEHF
Navy Extremely High Frequency Satellite Communications

Description: The Navy Extremely High Frequency (EHF) Satellite Communications(SATCOM) Program fields the AN/USC-38(V), an anti-jam, low-probability-of-intercept (LPI) communications terminal designed to accommodate a wide variety of command-and-control and communications applications (e.g., secure voice, imagery, data, and fleet broadcast systems). Navy, EHF terminals provide protected tactical and strategic communications to the naval warfighter. The terminal operates within the EHF uplink and Super High Frequency (SHF) downlink radio frequency spectra (termed Q band). The terminals are interoperable with Army and Air Force terminals and will operate with the five operational MILSTAR satellites as well as EHF payloads onboard Ultra High Frequency (UHF) Follow-On (UFO) satellites 4-11; with EHF payloads on the Fleet Satellite (FLTSAT) 7 and 8; and with the three planned (one operational

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in 2003) Polar EHF payloads which fly onboard classified host satellites. There are two different EHF waveforms.EHF Low Data Rate (LDR) that operates from 75 bps to 2400 bps, and EHF Medium Data Rate,(MDR) which ranges from 4.8 Kbps to 1.544 Mbps. MDR capability can be accessed only on Milstar satellites 4, 5, and 6. All other operational EHF satellite payloads provide LDR services only.

Program Status: Fielding of the LDR/MDR capable Follow-on-Terminal (FOT) continues toward completion projected for 2007. Planning is underway for fielding an Advanced EHF (AEHF) terminal capability to operate with AEHF satellites (MILSTAR replacement), which will begin operations in FY 2009. AEHF, a new waveform, will provide protected communications at data rates up to 8.1Mbps. The Navy AEHF Multiband Terminal (NMT) received Milestone B approval in October 2003, and will be developed by two competing contractors, leading to production starting in FY07. The NMT will then be fielded as a replacement terminal to the AN/USC-38 (V) series EHF terminals. In addition to providing communication capability at EHF Q band,the NMT will also operate in the SHF Ka and X bands.

Developer/Manufacturer: NESP and FOT: Raytheon, Marlborough, Massachusetts. NMT developers: Raytheon, Marlborough, Massachusetts,and Harris, Melborne, Florida.

GBS
Global Broadcast Service

Description: Joint tactical operations require high-speed, multimedia communications, and information flow for deployed, in-transit, or garrisoned forces,including lower-echelon users. The Global Broadcast Service will augment and interface with other communications systems to provide virtual two-way Internet Protocol networked communications to deliver a continuous,high-speed, one-way flow of high-volume information broadcast to support routine operations, training and military exercises, special activities, crisis, situational awareness, weapons targeting, intelligence, and the transition to and conduct of operations short of nuclear war. Homeland defensive operations are supported by a requirement for CONUS coverage, which also provides exercise support, training, and workups for deployment. GBS also supports military operations with U.S. allies or coalition forces. GBS is an information technologies, mission-essential, national security system providing network-centric warfare communications, but does not have nuclear survivability and hardening features incorporated. GBS provides a limited anti-jam capability because primary injection site broadcasts originate from sanctuary locations, but anti-jam is not a required capability. There may be an anti-jam requirement in the future. GBS inherently provides low probability of detection because equipment in receive-suites works with-out radiating signals and are relatively small. GBS will provide the capability to disseminate quickly large information products to various joint- and small-user platforms. GBS will revolutionize communications with increased capacity, faster delivery of data, near-real-time receipt of imagery and data to the warfighter, and reduced oversubscription of current MILSATCOM systems.

Program Status: The GBS space segment will be implemented in three phases. Phase I supported a continental United States (CONUS) testbed. Phase II is the GBS capability hosted on the last three UHF Follow-On (UFO) communications satellites. Launch of these satellites was completed in FY 2000. Beginning in FY 2005 additional GBS Phase II coverage and capacity is provided by launch of three Wideband Gapfiller Satellites (WGS). Phase III is an Objective capability planned as part of the Advanced Wideband System (AWS) I FY 2009-Plus.

The Navy plans to field GBS user terminals on all surface and submarine platforms and Navy mobile tactical shore facilities. Deployment on various aircraft platforms is under study by the Air Force. The Navy intends to field receive-suites on all classes of ships and submarine platforms. All ships in every deploying battle group should be equipped. All command and Flag-capable ships not assigned as members of deploying battle groups will be equipped. All ships in each deploying Marine Expeditionary Force (MEF) or comparable task force and all combatant ship and submarine requirements should be equipped by FY 2006. Submarines will be equipped in conjunction with installation of their submarine high data rate antenna capability.

In Dec 2002, via Program Decision Memorandum (PDM) I, OSD directed the Air Force to implement an enhanced architecture via migration to Internet Protocol. The enhanced architecture will provide significant improvements in capacity and coverage, nearly doubling worldwide capacity over potentially eight times more coverage. Afloat platform capability will be up to six multiple-receive channels up to 24 Mbps each and support additional security enclaves from unclassified, US SECRET, and two compartmented enclaves such as a Top Secret and an Allied or Coalition broadcast. Enhanced architecture permits receipt of multiple broadcasts including both national primary and multiple theater injection broadcasts. The enhanced architecture will also permit multiple different satellite receive capability including UFO and WGS or commercial satellites concurrently.

Developer/Manufacturer: Joint Program Office: U.S. Air Force, MILSATCOM Program Office, Space and Missile Systems Center. Phase II satellites: U.S. Navy SPAWAR, San Diego, California; and Hughes, Los Angeles, California. Phase II broadcast management and receive suites: Raytheon, El Segundo, California. Phase III satellites: to be determined. User receiver terminals: Various COTS/NDI. Tactical Broadcast Injection Terminals: U.S. Army, CECOM. Broadcast Management: U.S. Air Force, Electronic Systems Center. Information Management capabilities: Defense Information Systems Agency (DISA).

GCCS–M
Global Command and Control System–Maritime

Description: As the naval implementation of the Global Command and Control System (GCCS), GCCS-Maritime (GCCS–M)—formerly the Joint Maritime Command Information System, (JMCIS)—is the Office of the Secretary of Defense (OSD)-designated command and control (C2) migration system for the Navy. The evolutionary integration

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GCCS-M ➢

of previous C2 and intelligence systems, GCCS–M supports multiple warfighting and intelligence missions for commanders at every echelon, in all afloat,ashore, and tactical naval environments, and for joint, coalition, and allied forces. GCCS–M meets the joint and service requirements for a single, integrated, scalable Command and Control (C2) system that receives, displays, correlates, fuses, and maintains geo-locational track information on friendly, hostile, and neutral land, sea, and air forces and integrates it with available intelligence and environmental information. Key capabilities include multi-source information management, display, and dissemination through extensive communications interfaces; multi-source data fusion and analysis/ decision-making tools; and force coordination.

GCCS–M supports evolving concepts for Network-Centric Operations by receiving, displaying, correlating, fusing, and integrating all available track, intelligence and imagery information for the warfighter. In early 2004, more than 56 joint and Naval systems interfaced with GCCS-M to exchange data and support warfighter capabilities in 14 mission areas.

Program Status: GCCS–M Afloat is installed on more than 272 ships and submarines throughout the Navy. GCCS–M Ashore has been installed at 74 sites including the Chief of Naval Operations Navy Command Center; five Fleet Commander headquarters; Keflavik, Iceland; two Unified Combatant Commanders (USJFCOM and USPACOM); four Fleet High-Level Terminal (FHLT) sites; four Submarine Tactical Terminal (STT) sites; and various allied/NATO sites.

The GCCS-M program was redesignated to an ACAT-1AC program in March 2001 and is progressing toward milestone C approval in late FY 2004.GCCS-M Version 3.1.2.1 was released to the fleet in FY 2001, and included major enhancements to GCCS–M's intelligence and warfighting software applications. Version 3.1.2.1 dramatically reduces time-latency problems with Common Operational Picture (COP) track data, and enables high-data-rate communication-configured ships and shore headquarters to exchange COP track information via a faster Internet Protocol (IP) transmission method. GCCS–M Version 4, which will deliver quantum improvements over Version 3-series software, is under development and is scheduled for Operational Testing in FY 2004. The GCCS-M program began fielding computer hardware upgrades in FY 2000 and continues a phased hardware replacement program throughout the FYDP.

Developer/Manufacturer: Various COTS/GOTS.

IA
Information Assurance

Description: Information Assurance (IA) is defined as "information operations that protect and defend information and information systems (IS) by ensuring their authenticity, availability, confidentiality, data integrity, and non-repudiation." This includes providing for restoration of information systems by incorporating protection, detection, and reaction capabilities. The

Navy's primary IA program is Information Systems Security Program (ISSP), which has evolved in the recent years to adapt to the realities of rapidly changing information technology and the Department's need to manage the risks associated with networked IS. The IA Program provides the Navy Department with a broad range of services and equipment approved for the protection of sensitive, but unclassified, and classified information and IA.

The Department of Defense is developing a highly interconnected information environment, the Global Information Grid (GIG), of which the Department of the Navy is part. In that environment, a risk accepted by any one component is a risk shared by all. Once inside a network, there are often clear paths that allow an adversary to conduct attacks into many other systems and networks. To counter this threat, the Department has embraced a "defense-in-depth" ("DiD") strategy, which seeks to employ multiple layers of protection-from the desktop to the servers and throughout the network-in an effort to minimize the damage associated with any successful penetration of a network's perimeter. The IA Technical Framework (IATF) has been adopted and divides ISSP resources into three fundamental categories, essential to the successful achievement of DiD strategy: Technology, Operations,and People. The IATF, as the technology leg of the IA concept, provides a documented source of technical solutions and implementation guidance and incorporates the following defense-in-depth goals:

- **Defend the Network and Infrastructure**
- **Defend the Enclave Boundary/External Connections**
- **Defend the Computing Environment**
- **Provide Supporting Infrastructures**
- **Support Key Management Infrastructure**
- **Support Public Key Infrastructure**
- **Detect and Respond**

At this basic level, DiD success depends on technological capabilities and supporting services to provide networks and systems with protection from a wide range of adversarial attacks. ISSP focuses on development, acquisition, implementation, and periodic upgrade of the products and services, which provide protection. The deployment of Firewalls, Guards, Virtual Private Networks (VPN), large-scale Intrusion Detection Systems, Electronic Key Management Systems (EKMS) and sound security engineering are all part of the Depart- ment's implementation of IA protective technology. To support the secure use and management of our networks, there is a focus on network visualization and correlation tools to give our commanders a real time view of the cyber battlespace. In addition to these, there are a number of other technological thrusts under the ISS's umbrella. Public Key Infrastructure (PKI) technology, including smart cards, common-access cards (CACs), and tokens are being targeted for immediate deployment to meet DoD mandated timelines. This work involves PK-enabling network infrastructure components and system applications to ensure these components and applications can be used in a secure manner. Other technology focus areas involve the

secure delivery of voice, video and data across data networks (voice over IP and ATM backbones). To upgrade our cryptographic assets, the ISSP also focuses on the development of new, programmable cryptographic technology that can support a wide variety of applications and algorithms.

Once capabilities are implemented, they must be monitored to detect when, where, and how intrusions have occurred. Defensive Information Operations (DIO) capabilities, such as intrusion detection, warning, incident handling, and reporting and determining and generating an appropriate response are fundamental elements to the Department's DnD strategy. In addition, systems must be assessed periodically to verify the adequacy of their security posture and to re-accredit them for continued operation. To ensure the readiness of our afloat network posture, the Computer Network Vulnerability Assessment (CNVA) teams must continue to perform security assessments of our deploying battle groups and amphibious ready groups, and raise the awareness of shipboard operators and administrators through hands-on training. Selection, training, and retention of network security specialists are vital elements in our ISSP arsenal. An apprenticeship process, which includes on-the-job experience and formal/informal training combined with a disciplined certification process, will ensure network-centric warfare specialists are assigned to critical nodes afloat and ashore.

Program Status: Technology is provided through a series of specialized contract vehicles to provide the strongest TYPE I COMSEC (Communications Security) and best TYPE II COTS technology, to support the Navy's Secure Bandwidth requirements for Secure Voice and Secure Data and Public Key Infrastructure respectively, under the expanding umbrella of Key Management Infrastructure, currently Electronic Key Management. Operations are highlighted by the CNO's on-going major contributions to and participation in the DoD multi-billion dollar Crypto Modernization (CM) Program. The program's baseline requirements and deficiencies were initially identified and quantified by a select Navy team and continue to be updated as new issues and costs associated with CM are identified. Navy (N614) CM briefings for SecDef staffs and Requirements Oversight Committees are on going and receiving favorable response and support. N614's Computer Network Defense (CND) section is ensuring DoN-wide compliance with DoD IS security policies and procedures though a proactive approach and response to user applications and requirements.

The Space and Naval Warfare Systems Command enterprise provides operational support by: focusing IA resources to develop a cohesive IA program to serve the DoN warfighter, by supporting and implementing CNO policy, by dissemination of IA information, and providing a variety of technical and logistic services to the Navy Department's IA customers.

The Naval Research Laboratory (NRL) continues to develop DoN near-term and future COMSEC and PKI applications and devices. They are presently working with the National Security Agency (NSA) on two candidate CM products for DoD-wide

implementation. The Unified Command Plan assigned U.S. Strategic Command (USSTRATCOM),as the lead for DoD computer network operations including computer network defense. The Navy Computer Incident Response Team (NAVCIRT) is the Navy component of JTF-Computer Network Operations and is responsible for coordinating the Navy's computer network and system defenses within the Defense Information Infrastructure. Commander Naval Network Warfare Command (NETWARCOM) and Command Naval Security Group (COMNAVSECGRU) provide COMSEC Support and Defensive Information Operations. Director, Communica-tions Security Material Systems (DCMS) continues to maintain the most accurate database and system for storage, distribution, inventory accounting, and safeguarding of COMSEC material for the Navy, Marine Corps,and Coast Guard. Their program and records provided the critical information for the onset of CM. Early on, the Navy recognized the need for stringent IA Training for all network managers and incorporated the core IA training into existing information systems and network manager training courses. The scope of training has also been enhanced to encompass user-level training at the commands before users enter the network. Navy Component Task Force–Computer Network Defense (NCTF-CND), Fleet Information Warfare Center provides the operational support to Computer Network Defense through operations in the Fleet,Fleet NOCs, red and blue teams, as well as network monitoring.

Developer/Manufacturer: Various.

IBS/JTT
Integrated Broadcast Service/Joint Tactical Terminal

Description: The Integrated Broadcast Service (IBS) is a system-of-systems that will migrate the Tactical Receive Equipment and Related Applications Data Dissemination System (TDDS), Tactical Information Broadcast Service (TIBS), Tactical Reconnaissance Intelligence Exchange System (TRIXS),and Near Real-Time Dissemination (NRTD) system into an integrated service with a common format. The IBS will send data via communications paths, such as UHF, SHF, EHF, GBS, and via networks. This program supports Indications Warning (I&W), surveillance, and targeting data requirements of tactical and operational commanders and targeting staffs across all warfare areas. It comprises broadcast-generation and transceiver equipment that provides intelligence data to tactical users. The Joint Tactical Terminal (JTT) will receive, decrypt, process, format,distribute, and transmit tactical data according to preset user-defined criteria across open-architecture equipment. JTT will be modular and will have the capability to receive all current tactical intelligence broadcasts (TDDS, TADIXS-B, TIBS, and TRIXS). JTT will also be interoperable with the follow-on IBS UHF broadcasts. However, the current JTT form factor does not meet space and weight constraints for a majority of the Navy and Air Force airborne platforms. Therefore, to ensure joint interoperability, the Navy and Air Force will continue to support the current Multi-mission Airborne Tactical Terminal (MATT)

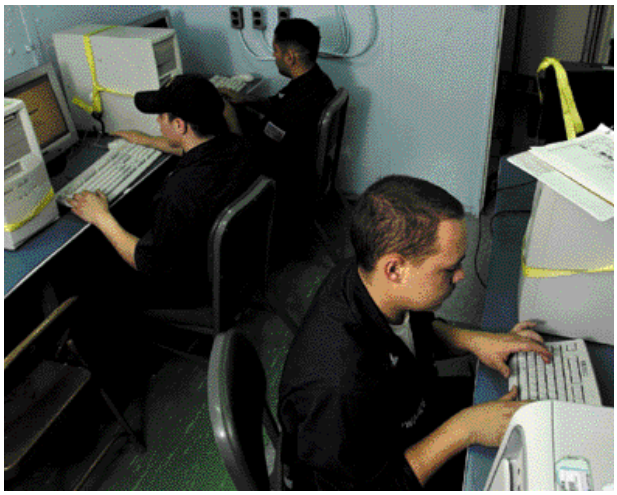
IBS JTT ➢

through a low cost Pre-Planned Product Improvement (P3I) program until the transition to an IBS capable JTRS airborne variant starting in FY 2007.

Program Status: A receive-only JTT was delivered to the Navy for early integration efforts in the third quarter FY 2000. The Navy received the first four fully capable JTTs (with transmit capability) in third quarter FY 2001. The Navy commenced shipboard installations in fourth Quarter FY 2001 for developmental testing. OT&E occurred in FY 2002,and JTT fielding will occur after successful OT&E. The JTTs will continue to receive the legacy broadcasts (e.g., TDDS, TIBS, TRIXS) until next-generation broadcast services are developed and fielded.

Developer/Manufacturer: IBS: TITAN/BTG. JTT: Raytheon Systems, St. Petersburg, Florida.

ISNS
Integrated Shipboard Network System



Description: The Integrated Shipboard Network System (ISNS) program is a derivative of the common elements from various other Programs of Record (POR) with the purpose of providing robust shipboard local area networks (LANs) on all Navy ships. ISNS provides integration and support for all requisite classifications (i.e., SCI, TS, GENSER, NON-U.S. and UNCLAS). The ISNS program implements networks using a combination of network switches, hubs, routers, servers, PCs and commercial network software application technologies. It provides the capability to establish connectivity to the Defense Information Systems Network (DISN) Wide Area Network (WAN) for global information distribution. In addition, it provides internal information dissemination capabilities for individual fleet units. By providing the infrastructure for all C4I programs, ISNS facilitates implementation of the Navy's IT21 strategy and is the primary enabler for network centric warfare. It provides the transport medium for web-enabling all IT21 related programs (i.e., NTCSS, GCCS-M, Voice-Video-Data (VVD)). ISNS networks support the robust information flow requirements necessary to achieve "Sea Power 21"capabilities, as well as providing the backbone for information interoperability with coalition forces.

Program Status: ISNS installations have transitioned from ATM networks to the Gigabit Ethernet architecture. Under current procurement and installation funding, FOC for ISNS is 2012.

Developer/Manufacturer: Hardware for procurement and development of ISNS is under the cognizance of PEO C4I/S pace PMW 165 as well as OPNAV (N61). These organizations work together to identify and implement the latest technologies to ensure proper implementation into the program.Engineering, development, integration, installation, training, and life cycle support will be accomplished through Navy and Defense Department activities.

JICO/JSS
Joint Interface Control Officer Support System

Description: The JICO Support System is a "tool set" enabling the JICO to properly plan and manage the Multi-TDL network in building and maintaining the Common Tactical Picture (CTP) in support of the Joint Force Commander. The CTP is the near-real time picture of air, space, surface, land and subsurface vehicular tracks as well as points, lines and areas. Because the CTP is the product of data provided primarily by the Joint Data Network (JDN),the JICO also serves as the theater JDN Manager. The JDN includes the Joint Force Multi-TDL network and those interfaces between the Multi-TDL network and national data nets. As JDN Manager, JICO plans, implements, monitors and manages the joint force Multi-TDL architecture and controls those interfaces between Interface Units (IUs) in the Joint Task Force and other networks that contribute data to the CTP.

Program Status: JICO Support System is in its first year of development with IOC planned for FY 2006.

Developer/Manufacturer: TBD

JNMS
Joint Network Management System

Description: The Joint Network Management System (JNMS) is a Combatant Commander and Commander, Joint Forces (CJF), Joint communications planning and management system. This software system will provide communications planners with the capabilities to conduct high-level planning, detailed planning and engineering, monitoring, control and reconfiguration, spectrum planning, and management and security of communications systems. It will promote force-level situational awareness; provide enhanced flexibility to support the commander's intent; improve the management of scarce spectrum resources; and provide increased security of critical systems and networks.

Program Status: Source selection occurred on 14 May 2001, and the first fielding of this system was expected in FY 2003. However, there were performance problems between JNMS applications and commercial off-the-shelf products that affected the database integration framework (DIF). The contractor was able to develop a new architecture to correct these shortcomings but has resulted in a program slip for initial fielding of system to late FY 2004.

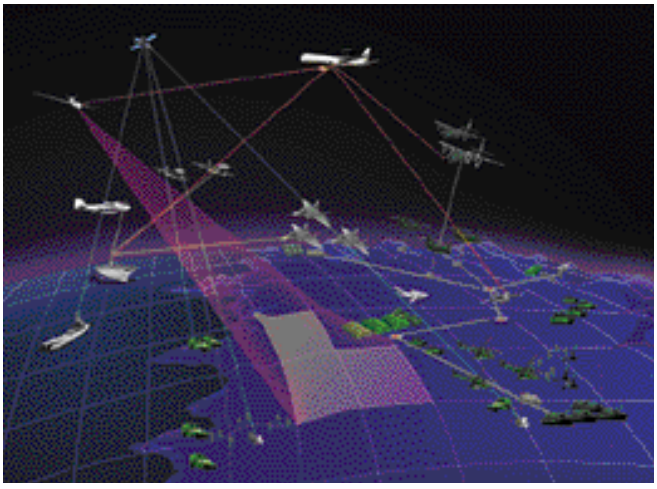
Developer/Manufacturer: Science Applications International Corporation (SAIC) San Diego, California, leads a team of eight other organizations.

JTIDS
Joint Tactical Information Distribution System

Description: This digital information-distribution system provides rapid, secure, jam-resistant (frequency-hopping) communications, navigation, and identification capabilities appropriate for military use up to and including Secret information. A joint program directed by the Office of the Secretary of Defense, JTIDS provides crypto-secure, jam-resistant, and low-probability-of-exploitation tactical data and voice communication at a high data rate to Navy tactical aircraft and ships and Marine Corps units. JTIDS also provides capabilities for common-grid navigation and automatic communications relay. It has been integrated into numerous platforms and systems,including U.S. Navy aircraft carriers, surface warships, amphibious assault ships, and E-2C Hawkeye aircraft; U.S. Air Force Airborne Warning and Command System (AWACS) aircraft; and Marine Corps Tactical Air Operations Centers (TAOCs) and Tactical Air Command Centers (TACCs). Other service and foreign country participants include the U.S. Army, Great Britain, and Canada. Additionally, JTIDS has been identified as the preferred communications link for Theater Ballistic Missile Defense programs. JTIDS is the first implementation of the Link-16 Joint Message Standard (J-series) and provides the single, near real-time, joint data link network for information exchange among joint and combined forces for command and control of tactical operations.

Program Status: The program successfully completed OPEVAL in August 1994 and was authorized to enter Full-Rate Production in March 1995. The Multifunctional Information Distribution System (MIDS) terminal is the Pre-Planned Product Improvement (P3I) to the JTIDS terminal.

Developer/Manufacturer: GEC-Marconi Electronics Systems, Wayne, New Jersey; Rockwell-Collins Avionics, Cedar Rapids, Iowa; and Northrop Grumman, Bethpage, New York.



JTRS
Joint Tactical Radio System

Description: Joint Tactical Radio System (JTRS) is a software programmable multi-band, multi-mode family of networkable radios,capable of simultaneous voice,data,and video communications. The program will effect the migration of over 25 radio families—thousands of radio systems—to the JTRS family of radio systems. All radios will be compliant with a single open system architecture—the Software Communications Architecture (SCA). SCA, now at version 2.2, provides the standards that all JTR software will be written to in the future. In addition, JTRS will be developed with a focus toward integrated GIG transformational capabilities. At the same time the JTRS will be backwards compatible with selected legacy radio systems. At present there are six designated Clusters that make up the JTRS family across DoD: handheld, man-packed, vehicular, airborne, small form-fit, and maritime/fixed variants. The JTRS requirements are derived from the Joint Tactical Radio System (JTRS)

Operational Requirements Document (ORD) Version 3.2 dated 9 April 2003. This Joint ORD is updated annually to incorporate additional validated requirements gathered from all the DoD Services. JTRS will be an enabler of FORCEnet by implementing current tactical communications standards in addition to future higher data rate networking waveforms. The first iteration of JTRS for the maritime forces will satisfy narrowband waveform requirements of the JTRS ORD. This will include HF, VHF, UHF Line-of-Sight (LoS), and current and future UHF SATCOM requirements. Follow-on spiral development for maritime and aircraft platforms will provide for narrowband and wideband requirements derived from the ORD, to include the Wideband Networking Waveform.

Program Status: The JTRS Cluster 3 (Maritime-Fixed variant) is a Navy-lead ACAT 1D program with program initiation expected in the second quarter FY 2004. The JTRS airborne variant is an Air Force led ACAT 1D program with initiation scheduled for the first quarter FY 2004. In November 2003, the Under Secretary of Defense for Acquisition, Technology & Logistics directed the Navy and Air Force to merge JTRS Cluster 3 (maritime/fixed sites) and Cluster 4 (airborne) to form a new cluster known as the Airborne Maritime Fixed (AMF) Cluster. JTRS Cluster AMF initially will be under Air Force Program control, with a contract award in FY 2004, a low rate of production commencing in FY 2008 and IOC expected in FY 2011.

Developer/Manufacturer:
Open competition decision, to be determined.

LSHF SatCom
Lightweight Super High Frequency Satellite Communications

Description: The Lightweight Super High Frequency (SHF) Satellite Communications

(SATCOM) terminal and parabolic antenna enable Navy ships to access the following systems: Defense Satellite Communications System (DSCS) for reliable,secure, beyond line-of-sight information exchange at medium-to-high data rates with other fleet units; fixed and mobile Joint and allied forces; and Navy C4I commands ashore. This capability is provided by upgraded and new WSC-6 terminal variants and enhancements to the Submarine High Data Rate (HDR, see separate program summary) Antenna, which provides an SHF capability for the Navy's attack submarines. Key services available via SHF SATCOM are as follows:

- **Defense Information Systems Network (DISN)**
- **Global Command and Control System (GCCS and GCCS-M)**
- **Contingency Tactical Air Control System (TACS) Automated Planning System (CTAPS) Advanced Narrow-Band Digital Voice Terminal (ANDVT)**
- **Worldwide direct dial STU-III capability**
- **PC-to-PC transfer via STU-III, voice teleconferencing**
- **Tactical Data Information Exchange Systems (TADIXS)**

- **Broadcast record message traffic**
- **Manual Relay Center Modernization Program (MARCEMP)**
- **Tomahawk Mission Planning packages and updates**
- **Imagery support**
- **DSN Telephone/ISDN access**
- **Joint Deployable Intelligence Support Service (JDISS)**
- **Joint Worldwide Intelligence Communications System (JWICS)**
- **Unclassified-but-Sensitive Internet Protocol Router Network (NIPRNET)**
- **Secret Internet Protocol Router Network (SIPRNET)**
- **Video Information Exchange System (VIXS)/Video Teleconferencing (VTC)**
- **Streamlined Alternative Logistic Transmission System (SALTS)**
- **Tactical Environmental Support System/Navy Integrated Tactical Environmental Subsystem (TESS/NITES)**

Program Status: SHF SATCOM capability is provided to Navy surface ships and submarines by several WSC-6 variants according to the requirements of those platforms. Surveillance Towed Array Sensor (SURTASS) platforms are configured with the WSC-6(V)1. Four aircraft carriers have the WSC-6 (V)4 variant. Numbered Fleet Commander flagships (AGFs/LCCs), the other eight aircraft carriers, and flag-capable amphibious ships (LHAs/LHDs are configured with the WSC-6(V)5. This variant provides a dual termination capability, enabling the ships to establish and simultaneously maintain their C4I links with Naval Computer and Telecommunications Area Master Stations (NCTAMS) and additional links with an Army, Marine Corps, or Air Force Ground Mobile Force (GMF) SHF terminal ashore in the AOR. The WSC-6(V)7 is a new, single-termination variant being fielded on Aegis cruisers and amphibious ship (LPDs and LSDs) classes. The AN/WSC-6(V)9 is a new, single-termination, dual (C/X) band terminal developed to provide wideband, high data rate capability to guided missile destroyers (DDGs) and amphibious ships (LPDs and LSDs). New-construction San Antonio (LPD-17)-class amphibious ships are also planned for an SHF SATCOM terminal variant installation. With the launch of the new Wideband Gapfiller Satellite (WGS) in 2005, most of the existing variants will begin to be upgraded to operate in Ka-band, to receive GBS via X-band and be fitted with enhanced bandwidth efficient modems. The follow-on to the WSC-6 (V)9 is planned to be a multi-band (X, Ka, C, Ku) terminal to replace the aging WSC-6(V)5s and various SCN platforms.

Developer/Manufacturer: Electro-Space, Inc., Dallas, Texas; Raytheon, Marlborough, Massachusetts; and various COTS/NDI vendors.

MIDS-LVT
Multi-functional Information Distribution System–Low-Volume Terminal

Description: MIDS–LVT is a multi-national cooperative development program to design, develop, and produce a tactical information distribution system equivalent to Joint Tactical Information Distribution System (JTIDS), but in a low-volume, lightweight, compact terminal designed for fighter aircraft with applications in helicopters, ships, and ground sites. U.S. Navy procurement, limited by available resources, is targeted for F/A-18 Hornet aircraft as the lead aviation platform and surface craft. MIDS–LVT is a pre-programmed product improvement and replacement for JTIDS, providing identical capabilities at reduced size, weight, and cost. As a P3I of the JTIDS Class 2 Terminal, the MIDS–LVT will employ the Link-16 (TADIL-J) message standard of U.S. Navy/NATO publications. MIDS–LVT is fully interoperable with JTIDS and was designed in response to current aircraft, surface ship, submarine, and ground host volume and weight constraints. The solution variants—MIDS–LVT (1), MIDS–LVT (2), and MIDS–LVT (3)—support U.S. Navy, U.S. Marine Corps, and U.S. Air Force aircraft; U.S. Navy ships; U.S. Army Patriot, THAAD, MEADS and ground-based defense systems;USAF and USMC ground-based Command and Control platforms; and potentially other tactical aircraft and ground-based systems. MIDS–LVT is an international project partnering the United States with Germany, Spain, Italy, and France.

Program Status: The program entered EMD in December 1993. Participating nations have developed an acquisition strategy, with the United States as the program leader. MIDS was approved for Low Rate Initial Production in FY 2000. It reached IOC on the F/A-18C/D Hornet in Fiscal Year 2003. MIDS is being procured for all F/A-18A+ through F/A-18F aircraft. The United States is the MIDS–LVT program leader with Germany, Spain, Italy, and France entering into a European partnership, called EUROMIDS. The Air Force F-15 fighter variant, MIDS–LVT (3), is currently in Full Rate Production and has reached IOC. The Army variant, LVT-2 entered Full Rate Production in September 2003. The Navy/Air Force variant, LVT-1, passed OPEVAL and was authorized to enter Full Rate Production on 9 September 2003. MIDS is planned to transition to OSD-mandated JTRS SCA compliance starting in FY 2003. This transition will allow for a smaller, lighter, and reduced-cost MIDS variant to meet Link-16 requirements on Marine Corps Offensive Air Support (OAS) assets and Navy helicopter platforms starting in FY 2007.

Developer/Manufacturer: An International consortium, MIDSCO, developed MIDS–LVT. U.S. manufacturers of production MIDS terminals are VIASAT of Carlsbad, California, and Data Link Solutions of Cedar Rapids, Iowa and Wayne, New Jersey. EUROMIDS will be the European producer of MIDS terminals.

MUOS
Mobile User Objective System

Description: The Mobile User Objective System (MUOS) will provide a replacement narrowband satellite communications (SATCOM) capability to the UHF Follow-On (UFO) satellite program. Anticipated to be an ACAT 1D program, this system will leverage commercial technology to the greatest degree possible. It will provide narrowband unprotected netted, point-to-point, and broadcast service of voice, video and data worldwide. The target users are Unified Commands and Joint Task Force Components, Agencies, and allied and coalition mobile users who need to communicate while on the move. The target radio for MUOS is the Joint Tactical Radio System.

Program Status: Concept Exploration studies and Analysis of Alternatives have been completed. The MUOS Operational Requirements Document was approved by the JROC on 17 July 2001. Based on technical and schedule risk, the Milestone Decision Authority changed IOC from 2008 to 2009. The Component Advanced Development (CAD) phase completes November 2003. Anticipate a Key Decision Point (KDP) B approval in February 2004 with award of Risk Reduction and Design Development (RRDD) contract in March 2004. The MOUS Operational Requirements Document (ORD) was approved by the JROC on 17 July 2001. Component Advanced Development (CAD) was completed in November 2003 and Independent Program Assessment (IPA) commenced 5 January 2004. The Service expects MUOS will reach IOC in 2009.

Developer/Manufacturer: To be determined.

NAVSTAR GPS
Global Positioning System

Description: The NAVSTAR Global Positioning System is a space-based,satellite, radio navigation system that provides users with worldwide, all-weather, three-dimensional positioning, velocity, and precise time data. Navy requirements include the integration of GPS in more than 300 surface ships and submarines and 5,100 aircraft, integration of shipboard combat systems with the Navigation Sensor System Interface (NAVSSI), and anti-jam protection for high-priority combat platforms through the Navigation Warfare (NavWar) program. GPS plays an important role not only in navigation, but also in providing precise time to precision strike weapons, naval surface fire support systems and ship command, control, communications, computers and intelligence (C4I) systems.

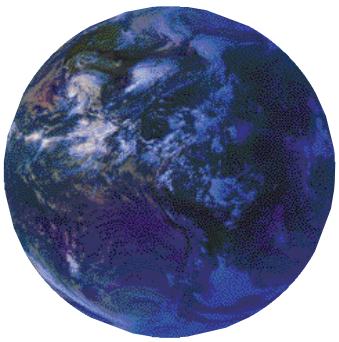
NAVSSI is a system that collects, processes, and disseminates position, velocity, and timing data to weapons systems, and C4I and combat support systems onboard surface warships. It hosts embedded, next-generation, card-based GPS receivers. NavWar will provide anti-jam antennas for the protection of select naval platforms in order to ensure a continued high-level of mission effectiveness in a GPS-jamming environment. NavWar also incorporates the capabilities of GPS modernization into Navy User Equipment, to receive the future military satellite signals.

Program Status: As of the end FY 2003, 100 percent of the ships and submarines had completed their initial GPS installations and 97 percent of aircraft integrations were complete. The FY 2004 and out-year budgets support equipping the remaining planned aircraft with initial GPS capability by 2005, providing surface combatants with modernized NAVSSIs through the FYDP, and ensuring that the GPS signal is protected on naval platforms.

Developer/Manufacturer: Rockwell-Collins, Cedar Rapids, Iowa; Raytheon, *Los Angeles*, California; Trimble Navigation, Sunnyvale California; Litton Data Systems, San Diego, California; ACS Technologies, San Diego, California; and Northrop Grumman, Virginia Beach, Virginia.

Navy METOC Sensors (Space)
Meteorological/Oceanographic Sensors

Description: The Navy METOC Sensors (Space) program supports Navy interests in meteorological and oceanographic (METOC) space-based remote sensors. These interests include commitments to satellite, sensor, and operational development activities associated with the Defense Meteorology Satellite Program (DMSP) and the National Polar-orbiting Operational Environmental Satellite System (NPOESS). The sensors carried on DMSP and future NPOESS satellites provide global oceanic and atmospheric data of direct operational relevance, including sea surface temperature, wind speed and direction, sea ice conditions, precipitation rates, and storm intensity. The program provides for Navy participation in Navy/Air Force cooperative efforts leading to current and future METOC sensor development, including calibration and validation of instruments and delivery of satellite products to the Fleet.



Program Status: In October 1997, the program commenced development of CORIOLIS/WINDSAT, the world's first space-based sensor that passively measures ocean surface wind speed and direction, launched in January 2003. Development of the Airborne Polarmetric Microwave Imaging Radiometer (APMIR) for calibration and validation (cal/val) of the Air Force Special Sensor Microwave Imager/Sounder (SSMIS) and CORIOLIS/ WINDSAT began in early FY 1998. APMIR is in service to support the first SSMIS mission on DMSP-F16,launched in October 2003. APMIR will continue as an ongoing cal/val program for DMSP, CORIOLIS/WINDSAT, and NPOESS microwave radiometer sensors. In addition to these projects, discussions are underway with NASA, NOAA, and other agencies to fulfill the long-standing requirement for geostationary environmental imagery of the Indian Ocean.

Developer/Manufacturer: WINDSAT Sensor: Naval Research Laboratory (NRL), Washington, D.C. CORIOLIS Spacecraft: Spectrum Astro, Gilbert, Arizona.

NILE Link 22
NATO Improved Link 11

Description: Link 22 is the next-generation NATO Tactical Data Link also referred to as the NATO Improved Link Eleven (NILE). It is a co-development program with seven NATO countries and

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NILE Link 22 ➢

is in the latter half of its research and development phase. As an evolutionary new Link design, Link 22 is based on modern, media-independent networking technology that will be applied in the exchange and forwarding of tactical data at extended ranges and between multiple networks over a variety of RF media.A member of the J-series family, Link 22 will complement Link 16 by providing BLOS connectivity among C2 platforms and modern, robust, relay/routing techniques. The Link 22 design includes a growth feature to accommodate the addition of SATCOM media for BLOS J-series data exchange. Link 22 will support interoperability with critical Allied/Coalition partners that have transitioned from Link 11 to Link 22 but do not possess a Link 16 capability. Implementation of Link 22 will ensure Allied/Coalition forces maintain the level of Situational Awareness (SA) required to plan and execute coordinated combat operations across the Allied/Coalition Area of Responsibility. Since Link 22 is an evolutionary TDL, NGC2P will implement hardware and software changes that will provide a full Link 22 capability with little if any change to host combat systems.

Program Status: Link 22 will first be introduced in an adjunct processor to CDLMS in FY 2006. Full Link 22 functionality will be introduced as part of the Next Generation Command and Control Processor in FY 2007.

Developer/Manufacturer: Northrop Grumman,VIASAT, SPAWARSYSCEN, San Diego, California.

NMCI
Navy/Marine Corps Intranet

Description: In 2000 the Navy initiated an innovative approach in obtaining information technology (IT) services. The Navy/Marine Corps Intranet (NMCI) contract, awarded in October of 2000,is a seven-year contract with a three-year option to procure service-wide, shore based IT services for voice, video, and data. This first-of-its-kind initiative in DoD replaces hundreds of independent ashore networks with a single,more secure network that improves IT connectivity Navy-wide. This contracted service provides a seamless end-to-end network with higher performance standards and increased security when compared with the current system. The NMCI network will also provide significant potential for increased efficiency as the infrastructure for enterprise-wide applications. In addition,the NMCI will provide the warfighter easier and more rapid access to data and information when and where it is needed.NMCI's architecture is compliant with the standards of the DoD's Global Information Grid-Bandwidth Expansion (GIG-BE) and is the Navy's vehicle for the first major implementation of DoD mandated Public Key Infrastructure (PKI).

Program Status: The service has been designated an operational evaluation oversight program by Director, Operational Test and Evaluation, in the Office of the Assistant Secretary of Defense for Network Information Integration (OASD NII). NMCI has successfully completed all OSD directed milestone decision points leading up to approval for full program implementation. As of

October 2003, the NMCI vendor team has taken responsibility for managing approximately 277,000 Navy and Marine Corps data seats and cutover more than 116,000 of those seats to the new NMCI desktops and networking environment. At program steady state NMCI will be providing IT network connectivity for more than 346,000 DoN users.

Developer/Manufacturer: The NMCI contract was awarded to a team of contractors led by Electronic Data Systems (EDS). The remainder of the contractor team comprises Dell for hardware, WAM!NET for network architecture, WorldCom for long-haul connectivity and voice services, and Raytheon for information assurance.

NTCSS
Naval Tactical Command Support System

Description: The Naval Tactical Command Support System (NTCSS) is the mission essential U.S. Navy combat logistics support information system that enables unit commanders and their chains of command to manage and assess the readiness of unit and battle group material and personnel. NTCSS is a cornerstone of the Sea Base aspect of the three "Sea Power 21" pillars. Sea Base includes joint command and control, fire support, and logistics. This program provides combat support systems to surface, sub-surface, and aviation operational commanders. Its support functions include organizational maintenance, supply, and personnel administration through every level of operations, in peacetime and during war. NTCSS also supports network-centric warfare by integrating logistics information for the warfighter. It replaces, merges, and optimizes legacy Shipboard Non-tactical ADP Program (SNAP), Naval Aviation Logistics Command Management Information System (NALCOMIS), Maintenance Resource Management System (MRMS), and several smaller logistics applications into an integrated logistics system. NTCSS, through migration with the Defense Information Infrastructure Common Operating Environment (DII COE) technical architecture, will be used to complete the tactical readiness picture for operational commanders by supporting the Global Command Support System (GCSS) and the Common Operational Picture. This program employs an evolutionary strategy merging the technical and functional capabilities of the system components. The first stage of the strategy included hardware modernization and network installations using open system architectures and operating environments at all sites. This hardware environment is common with tactical programs and compliant with DII standards. The second stage involves technical optimization of the functional applications using modern software development tools, relational databases, and a common operating environment. Follow-on stages of the program involve development and implementation of Business Process Improvements (BPIs) under the sponsorship of functional and fleet managers and the movement of logistics applications into a content-level web-based environment. BPI development, when integrated with Business Process Re-engineering and Enterprise Resource Planning efforts, will support increased efficiencies from improved operations, reduced manpower, and migration of work from afloat to

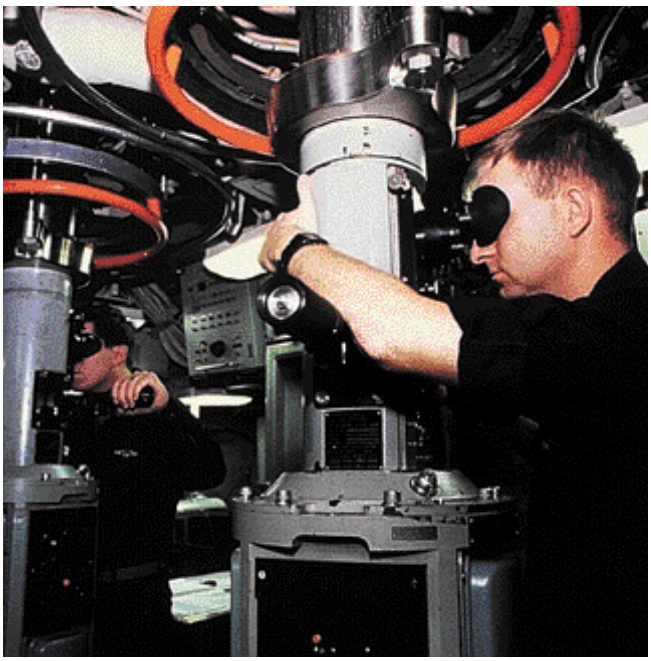
NTCSS ➢

ashore units. As a result, the Navy will be able to reduce total ownership cost across the theater of operations.

Program Status: The program is currently in phase two: fielding NTCSS-Optimized on ships, submarines, and afloat and ashore aviation intermediate maintenance activities to support the modernization of the logistics operations of operating forces. Once successful Low Rate Initial Production evaluation is achieved, phase three can begin, allowing legacy SNAP III units to transform directly to the web-enabled eNTCSS environment. NTCSS-Optimized platforms will also upgrade to eNTCSS.

Developer/Manufacturer: The COTS hardware is being procured through indefinite delivery/indefinite quantity government contracts. Engineering, development, integration, installation, training, and life cycle support will be accomplished through Navy and Defense Department activities, with additional support from industry partners.

SCI ADNS
Sensitive Compartmented Information Automated Digital Network System



Description: SCI ADNS (previously TACINTEL II) is an Internet Protocol (IP)-capable, network-centric, automated communication system for real-time receipt and transmission of Special Intelligence (SI) and Sensitive Compartmented Information (SCI) data while satisfying established Information Assurance (IA) Computer Security criteria. SCI ADNS provides secure and reliable IP communications for Cryptologic, Intelligence, and Information Operations (IO) systems supporting strike group commanders; including Direction Finding (DF) Data Transfer, Record Messaging, E-Mail, Chat,File Transfer and Web Browsing. SCI ADNS uses open-architecture standards,and is thus a critical element in the Navy's evolving concept of network-centric warfare. The full capability will include voice, video and data transfer among SCI-capable ships and submarines, with gateways to shore nodes. Under the submarine phase of the program, SCI ADNS brings the Top Secret Enclave to submarines in addition to the SCI Enclave.SCI ADNS is the lead program for implementing the SI/SCI portion of the Joint Maritime Communications Strategy (JMCOMS) under the C4I Networks initiative.

Program Status: Installation of shore Network Operations Center Facilities is complete, however Defense in Depth DCID 3/6 security upgrades are being fielded with completions scheduled in 1Q FY 2005. Installation of Build-1 ship hardware began in FY 1999 and was completed early in FY 2003. Release 2.2 began fielding in 4Q FY 2003. A Milestone III full-production decision was approved on 4 October 2001. Incremental hardware and software upgrades scheduled through FY 2004 and beyond will provide the following capabilities: Defense in Depth security, Submarine Version (to include TS), Packet Prioritization, Direct Ship-to-Ship Network Services, Quality of Service, Interface to Defense Messaging System (DMS), and an Interface Afloat to DMS. SCI Networks has been designated as an evolutionary program allowing for continued growth and expansion through future

technology insertion. It provides the mechanism for phased implementation of both planned improvements and those that surface through advancing technology. The premise of using COTS,GOTS, NDI and existing systems to meet the requirements for SI communications will continue to be followed. To realize the FORCENET architecture, FY 2005 through FY 2008 program funds will procure and incorporate the capabilities necessary to implement the emerging DOD/Joint architecture enabling SCI Networks to continue providing rapid, reliable, and secure SI communications to the Fleet well into the future.

Developer/Manufacturer: Science Applications International Corporation, Arlington, Virginia.

SLR-25(V)1 ACCES
Advanced Cryptologic Carry-on Exploitation System

Description: ACCES is a carry-on cryptologic exploitation capability for ships not equipped with a permanent cryptologic capability. ACCES hardware and software are similar to that of the SSEE (AN/SLR-25(V)2) system, with minor hardware differences to facilitate multiple shipboard installations and removals. The system provides front-end sensor (receiver) control through Local Monitor Station (LMS),tactical surveillance,targeting, and Indications and Warning (I&W), as well as passive detection, classification, and tracking of selected targets at extended range. It also provides tools to allow interpretation and reporting of intercepted data, geographic plot and analysis,and track correlation. When ACCES is paired with a transportable-Radio Direction Finding (T-RDF) system, the supported warship commander has a comprehensive and complete signals intelligence (SIGINT) capability.

Program Status: Installations in *Arleigh Burke* (DDG-51) Aegis destroyers and amphibious assault ships continue.

Developer/Manufacturer:
SPAWAR Systems Center, Charleston, South Carolina.

SSQ-137 SSEE Increment E
Ship Signal Exploitation Equipment

Description: The SSQ-137 SSEE Increment E program is a signal acquisition system that provides warship commanders with threat identification information. SSEE also provides cueing to radio direction finding assets, providing a comprehensive intelligence (SIGINT) capability. SSEE is a COTS/NDI program that is easily reconfigured and therefore able to respond rapidly to tasking. The system design permits the rapid insertion of new and emerging technologies and is the building block that will integrate capabilities from existing systems and insert advanced technologies into a single, scalable, spirally developed and interoperable Maritime Cryptologic System for the 21st Century (MCS-21). SSEE Spiral E will be the first step toward MCS-21 and will improve front-end sensor capabilities (software receivers) to exploit current and emergent signals of interest, enable Information Warfare capabilities, and provide embedded scenario based training.

SSQ-137 SSEE Increment E ➢

Program Status: SSEE Increment E was recently approved for FRIP and will be backfitted on all programmed combatants.

Developer/Manufacturer:
Argon Engineering Associates, Fairfax, Virginia.

TIS
Trusted Information Systems

Description: To facilitate development and expansion of a Commander's capability automatically to exchange critical intelligence and operational information with all forces whether U.S., allied, or coalition, the complementary Multi-Level Security (MLS) capabilities of the Navy's Ocean Surveillance Information System (OSIS) and Radiant Mercury were combined into a single TIS program. The OSIS Evolutionary Development (OED) system is DoD's only PL-4 accredited C4I processing and dissemination system. It serves as the backbone automated information system supporting the Common Operational Picture (COP) at U.S. and allied Joint Intelligence Centers (JICs). OED receives, processes, and disseminates timely all-source surveillance information on fixed and mobile targets of interest, both afloat and ashore, within an MLS environment. OED permits operators to collaborate in multiple domains,monitor, analyze, and support multiple views of the battlespace corresponding to multiple security classification levels. Its robust correlation and communications subsystems ensure extremely rapid delivery of both record message traffic and intelligence broadcasts in support of the Unified Combatant Commanders, Joint Task Force commanders, individual units, and allies.

The MLS capabilities in OED are certified and accredited to support compartmented multi-level networks at the SCI level and are envisioned to serve as the core technology upon which future Navy networks and databases running at multiple classification levels can be effectively combined to allow appropriately cleared operators access to information from a single workstation.

Radiant Mercury (RM) provides the accredited capability to automatically sanitize, transliterate, and downgrade classified, formatted information to users at lower classification levels. RM helps ensure critical Indications and Warning intelligence is provided quickly to operational decision makers at various security and releasability levels. RM is currently fielded on Force Level ships bridging data transfer between SCI GCCS–M and GENSER GCCS–M. RM also serves as a sanitizer within OED. Radiant Mercury Imagery Guard (RMIG) combines a digital signature process with RM allowing the networked transfer of imagery between security domains.

Program Status: Twenty-two U.S. and foreign operational sites rely on OED for allied interoperability and MLS analysis and dissemination. U.S. OED sites include European Command, Pacific Command, and Joint Forces Command Joint Intelligence Centers; Commander, Second Fleet and Commander, Seventh Fleet. Allied OED users include United Kingdom, Japan, Australia and the Republic of Korea. Current developments are focused on integrating OED's multi-level security capabilities with afloat, joint, and coalition-network architectures. OED installations are

planned at Integrated Undersea Surveillance System (IUSS) sites in FY 2004 to support US Secret/Allied/SPECAT interoperability. As Executive Agent of the multi-service RM sub-program, the Navy will continue to oversee RM and RMIG support to more than 120 locations worldwide.

Developer/Manufacturer: OED: Maxim Systems, San Diego, California; Inter-National Research Institute, Arlington, Virginia; Litton/PRC Industries, McLean, Virginia; TRW, Fairfax, Virginia; SPAWAR System Center, San Diego, California; and Mitsubishi and Hitachi, Tokyo, Japan (for the Japanese Maritime Self-Defense Force only). RM/RMIG: Lockheed-Martin, Denver, Colorado.

UFO
UHF Satellite Communications Follow-On

Description: The Ultra High Frequency (UHF) Follow-On (UFO) satellite program comprises eight satellites and one on-orbit spare,and it replaced the Fleet Satellite (FLTSAT),Gapfiller, and Leased Satellite (LEASAT) UHF constellations. UHF SATCOM services, provided by UFO, include worldwide, narrowband, unprotected netted, point-to-point, and broadcast service of voice, video, and data using 5 and 25Khz UHF channels. UFO also provides a protected Fleet Broadcast using an Extremely High Frequency (EHF) uplink and UHF downlink to provide an anti-jam capability on the uplink.UFOs 4-11 carry an EHF payload that provides anti-jam capability on the uplink and downlink. Protected services include netted, point-to-point, and broadcast service of voice and data. The EHF payload also provides an anti-jam telemetry tracking and control uplink capability. UFOs 8-10 also include a Global Broadcast Service (GBS) payload. GBS uses direct broadcast technology at an extremely high data rate to many users via very small terminals.

Program Status: Ten satellites have been launched and nine are operational. The launch of UFO 1 was a failure, and UFO 10 was launched in November 1999 to replace it. The first launch of UFO with GBS capability occurred in 1998. A Gapfiller (UFO-11) was launched in the 2003 time frame to maintain a constellation availability of 70 percent through 2010. In 2009, Mobile user Objective System (MUOS) will begin replacing UFO. A sole-source modification has been made to the existing contract with Boeing to build UFO-11. Ten satellites are fully operational after the launch of a Gapfiller satellite (UFO-11) in December 2003. The Gapfiller was required to maintain a constellation availability until the Mobile User Objective System (MUOS) in achieves IOC in 2009.

Developer/Manufacturer: Boeing Satellite Systems (BSS), *Los Angeles*, California; and SPAWAR Systems Command, San Diego, California.

USQ-167
Common Datalink

Description: The AN/USQ-167 CDLS is a surface-mounted terminal that supports Navy and joint airborne sensor programs that require data communications with shipboard processors of National and Tactical Intelligence, Surveillance, and Recon-naissance (ISR) programs with the Common Data Link (CDL) family

USQ-167 ➢

of communication systems. CDLS receives signal and imagery intelligence data from remote sensors and transmits link and sensor control data to airborne Intelligence, Surveillance, Reconnaissance (ISR) platforms via the CDL Class I specification, Revision F compliant waveform at data rates up to 274 Mbps. The CDLS system provides an interoperable Network Interface to which Intelligence, Surveillance,and Reconnaissance (ISR) Exploitation Equipment may interconnect. The CDLS will support CDL missions for simultaneous multiple users on Navy ships.

Program Status: CDLS is in production.

Developer/Manufacturer:
CUBIC Communications, San Diego, California.

USW-DSS
Undersea Warfare-Decision Support System

Description: The Undersea Warfare-Decision Support System (USW-DSS) program provides an integrated,near-real time,net-centric Undersea Warfare (USW) Command & Control (C2) capability across multiple platforms and even with low bandwidth or intermittent inter-platform communications.

It leverages existing communication links, networks, contact pictures, and sensor data from air, surface, submarine, theater, and surveillance platforms and integrates them to produce a common USW near-real time decision support tool. USW-DSS provides a critical capability, not only for the Sea Combat Commander (SCC), but also for the Theater USW Commander (TUSWC), Antisubmarine Warfare Commander (ASWC), and Mine Warfare Commander (MIWC) for an integrated capability to plan, conduct, and coordinate USW operations with multiple ASW and MIW platforms. USW-DSS will provide common and improved visualization, integrated USW platform sensor data sharing, reduced data entry, improved performance prediction, reduced redundancy across USW Tactical Decision Aids (TDAs), and data fusion, which is currently not available to the SCC. USW-DSS will provide greater understanding of the undersea battle space by allowing the entire force (CSG/ESG, Theater, or other) to have a common,thorough understanding of the battle space with characterized uncertainties. USW-DSS will also serve as the single consolidated repository for all USW TDAs across all USW platforms, thus saving the cost of maintaining numerous individual applications,TDAs, and stove-piped systems.USW-DSS will therefore be able to provide a USW "one-stop shop" for the Commander at the highest level, as well as to the operator on the deckplates.

USW-DSS uses the spiral development process, and a Peer Review Group will select current and developmental technologies to be incorporated into a build-test-build process to develop a net-centric USW capability. USW-DSS Builds 1,2,& 3 (FY 2006-FY 20011) will align with COE (Common Operating Environment)/GCCS-M (Global Command and Control System-Maritime Applications)/NCES (Net Centric Enterprise Services), FORCEnet, JC2 (Joint Command and Control)-as a maritime application, and PEO IWS (Program Executive Office for Integrated Warfare Systems) Open Architecture. Current

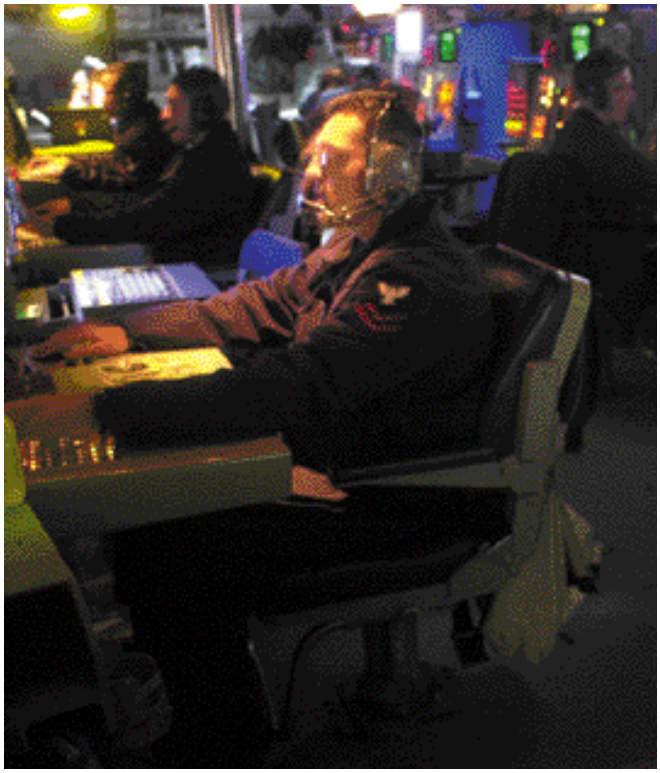
plans are for USW-DSS to transition into a GCCS-M application with a subsequent migration as a maritime application in JC2.

Program Status: A Top Level Requirements (TLR) document was recently signed by the Warfare Sponsor, Sea Shield ASW (formerly N74) on 2 October 2003, and was documented based on high-level guidance from a Net-Centric USW (NCUSW) Mission Needs Statement (MNS). In FY 2004 and FY 2005,USW-DSS will be installed as a TEMPALT (Build 0) on selected platforms in two CSGs and Fleet feedback will assist in the design of Build 1. Each year starting in FY 2005, USW-DSS will be installed on undersea warfare combatants in two CSGs and two ESGs as well as Theater USW assets and MIW assets. One ESG and one CSG install will include approximately one CVN, six DDGs/CGs, two SSNs, two IUSS ships,six P-3s,nine Theater shore nodes (two CTFs on each coast,two TSCs on each coast,and one training facility),and two MIW command nodes and/or command ships (out-year installs will be modified to match force structure).

Developer/Manufacturer: Multiple Navy and University labs and Industry participants will perform the various developer and manufacturer roles. Progeny Systems Inc is the current software integrator for Build 0. The software integration role for each Build (1, 2, & 3) will be competed amongst industry and labs.

WEN
Web-Enabled Navy

Description: The CNO is convinced that now is the time to exploit modern technologies and to accelerate efforts to create an integrated and transformational information exchange. In April 2001, he directed the establishment of Task Force Web (TFW) to lead the Web transition effort. The purpose of the Task Force is to get us on course and quickly achieve a Web-Enabled Navy (WEN) by FY 2004. The Navy Enterprise Portal (NEP) is a component of FORCEnet, Sea Trial and Fleet Battle experiment- Kilo (FBE-K) and supports MCP Networks.



One of the key requirements in any Network Centric Warfare architecture is the ability to exchange data transparently. Throughout recent years there have been many DOD and DON attempts to meet this requirement,some more successful than others. Recent industry standards developments (e.g., XML, SOAP, UDDI, SAML) have made this goal achievable. Incorporating these industry standards in the WEN will enable the Navy to effect this transformation to realize Network Centric Warfare. It will help to make the warfighter far more productive with inclusion of tools such as sharing of disparate data base information between systems and the ability to rapidly manipulate and customize the presentation of such data to the needs at hand.

Implementation of the WEN, thus, is a revolutionary, transformation process that will rationalize many of the existing inconsistencies in the way Navy information systems currently work together to bring a truly seamless network-centric warfighting capability. To achieve this transformation,WEN will leverage and influence the planned capabilities and resources of IT programs within both the shipboard IT21 and NMCI shore

WEN ➢

environment. TFW has researched and developed the architecture, standards and protocols to guide web-enabled application developers in their efforts to integrate into the WEN environment. At the enterprise level, the NMCI ashore WEN portal and the IT21 afloat WEN portal will interface to share user information, data, services, and content. The Base Level Information Infrastructure (BLII) overseas and the Marine Corps Enterprise Network (MCEN) will also leverage these capabilities as they are implemented. Enabling technologies and processes to be employed include PKI enabled Single Sign-On, a Naval Global Directory Service providing a single flat name-space for users; synchronization user directories, a synchronized relationship between portal instances; and establishment of a common data replication process between NMCI,BLII, MCEN and IT21.

Program Status: TFW Washington, Norfolk and DON CIO are coordinating with DASN RDA for acquisition approval to develop a Navy Marine Corps Portal (NMCP) program with an IOC capability in May 2004. Classified and unclassified portal pilots have been implemented ashore and afloat. These pilots are consistent with the guidance specified for the enterprise web architecture, and will be rolled into the NMCP infrastructure concurrent with the IOC of the NMCP. Users access the web enabled application services using a PKI/SSO enabled enterprise portal system. For the shore pilot, the portal is internal to the Navy/Marine Corps intranet (NMCI) and is run out of the Norfolk and San Diego NMCI network operation centers (NOCs). The afloat and ashore portals will be fully connected for redundancy, replication and ease of access.

Developer/Manufacturer: SPAWAR has the lead in architecting, implementing, and testing the infrastructure and services that comprise the Navy Enterprise Portal-Afloat. General Dynamics has the contract for upgrade of Baseline II that will include Web Enabling capabilities. ISF/EDS is the contract company for NMCI.

Airborne Systems

ACS
Aerial Common Sensor

Description: ACS is designed to replace the aging EP-3E aircraft. The ACS platform will be hosted on a commercial business jet sized aircraft and support tactical, theater, and national ISR requirements. The increased speed and altitude performance capabilities of the ACS aircraft will match and in the future (Block 2) exceed EP-3E ISR persistence. ACS will provide transformational multi-intelligence precision targeting system support to the warfighter. ACS will expand intelligence, surveillance, and reconnaissance (ISR) operations beyond a SIGINT-only capability. Multi-INT capabilities include traditional SIGINT (COMINT and ELINT) and additional "INTs" provided by synthetic aperture radar, ground moving target indicator, electro-optical, infrared, and hyper spectral imaging sensors. ACS will be capable of automatic and manual intelligence fusion in order to provide superior decision quality information to commanders.

ACS will have a robust reach-back capability to Regional SIGINT Operations Centers (RSOC) and use transformational communications. Both on and off-board operators will have equal access to sensors. ACS will be a node inside the Maritime Cryptological System architecture and within the Global Information Grid. This network-centric constellation approach will horizontally integrate ACS with other USN and National assets. Additionally, ACS will meet Joint Airborne SIGINT Architecture (JASA) DoD standards for interoperability.

Program Status: ACS is an Army and Navy joint program, with Army as the lead service. Army ACS ORD was approved by JROC memorandum on 20 October 2003, and the Navy ACS ORD annex was approved by JROC memorandum on 03 May 2004. The Army is awaiting MS B and DAB authority currently scheduled for June 2004. The Navy will return with Interim Program Review (IPR) and will procure between 14-19 ACS airframes. Final inventory figures will be determined after source selection. The EP-3E will be modernized to a common configuration and sustained until ACS reaches IOC in 2012. FOC is expected by 2014. The final ACS inventory should reduce LD/HD ISR shortfalls.

Developer/Manufacturer: Source selection TBD. Primary competing companies are: Lockheed Martin and Northrop Grumman.

BAMS UAV
Broad Area Maritime Surveillance
Unmanned Aerial Vehicle

Description: In December 2001,the Secretary of the Navy directed the accelerated acquisition of an unmanned persistent intelligence, surveillance, and reconnaissance (ISR) capability in support of the warfighter leveraged on Global Hawk UAV technology. The Broad Area Maritime Surveillance (BAMS) UAV will provide a high-altitude, persistent ISR capability that will play a role in FORCEnet and Sea Shield and will function as an enabling force element for the fleet commander. The BAMS UAV is a transformational initiative and a critical element of the Chief of Naval Operation's "way ahead" for the Navy. BAMS UAV will support a spectrum of fleet missions serving as a distributed ISR node in the overall naval-maritime environment. ISR queuing, strike support, and SIGINT are examples of the BAMS UAV missions. It will be the fleet commander's "low-hanging satellite" and will act as an information-collection hub that can operate independently or in direct collaboration with other manned, unmanned, and space-based platforms. The capability is needed now, but FY 2008-2009 was judged to be the earliest a mature, high-altitude UAV capability could be fielded. Additionally, there is an ISR capabilities gap that exists today, and that deficit will grow as the P-3/EP-3 manned aircraft fleet begins to retire. Although BAMS UAV will help address this deficit, it is not intended to be a one-for-one replacement for any manned aircraft. (There is also great interest in the U.S. Coast Guard for the BAMS UAV, as a "Maritime Domain Awareness" element of that service's Integrated Deepwater Systems program.)

Program Status: The BAMS UAV program will enter System Design and Development in FY 2005. The Navy is preparing doc-

umentation—including an analysis of alternatives (AoA), concepts of operation, operational requirements document, C4 Integrated Support Plan, acquisition strategy, and procurement documentation—to support an FY 2004 MS B. Initial CONOPS support forward deployment to five sites worldwide, with initial infrastructure incorporated under P-3 Tactical Support Centers (TSCs) and predominately supported by Maritime Patrol and Reconnaissance personnel.

Developer/Manufacturer: To be determined.

E-2C Hawkeye 2000
Airborne Early Warning Aircraft Upgrade

Description: The E-2C Hawkeye is the Navy's airborne surveillance and command-and-control platform, providing battle management and support of decisive power projection at sea and over land in a joint operational architecture. In addition to current capabilities, the E-2C has an extensive upgrade and development program to prepare it as a critical element in an overall joint theater air and missile defense program.

Two major upgrades will ensure that the Hawkeye force will keep pace with changing tactical environments: the E-2C Hawkeye 2000 upgrade and the Advanced Hawkeye (AHE) which includes the Radar Modernization Program. The E-2C Hawkeye 2000 is the most advanced Hawkeye variant currently in production and features:

- **Mission Computer Upgrade (MCU)**
- **Cooperative Engagement Capability (CEC)**
- **Improved Electronic Support Measures (ESM) system enhancing the E-2's capabilities in the 21st century threat environment**
- **Joint Tactical Information Distribution System (JTIDS)**
- **Global Positioning System (GPS)**
- **Data and voice satellite communications**

The MCU greatly improves weapons systems processing power and enables the incorporation of CEC. In turn, CEC-equipped Hawkeyes—the E-2C is the first aircraft in the U.S. aviation arsenal to incorporate this system—will significantly extend the engagement capability of surface forces. The CEC-equipped Hawkeye is the key to early cueing of the Aegis Weapon System, dramatically extending the lethal range of the Standard Missile (SM-2). The Advanced Hawkeye's Radar Modernization Program is developing an advanced demonstration radar for the Hawkeye that will bring over-the-horizon, overland detection, and tracking to the battle group. This, coupled with CEC, will fully integrate Advanced Hawkeye into the Theater Air and Missile Defense (TAMD) role. This advanced detection and tracking capability, in conjunction with the Aegis and upgraded Standard Missiles (SM-2 Block IV and SM-3), will allow the battle group to deploy an organic, theater-wide air and cruise missile Sea Shield umbrella for protection of high-priority defended areas and U.S. and coalition forces. Additionally, the E-2's systems are fully interoperable with the Airborne Warning and Control System (AWACS) and ground-based systems for a seamless transition to a full joint architecture.

The Navy is ensuring that the Hawkeye continues as the airborne "eyes and ears" of the Fleet as it applies the aircraft's capabilities in the integrated Joint, overland, theater-wide air- and cruise missile-defense environment. Many of the technological improvements being incorporated in the Hawkeye represent leading-edge improvements in all U.S. forces, not just in the Navy's theater air and missile defense programs.

Program Status: The Navy intends to procure 25 Hawkeye 2000s through 2007. Aircraft with CEC are undergoing testing at Naval Air Station, Patuxent River, Maryland. Technical and Operational Evaluations began in 2002 and the IOC for the CEC-configured Hawkeye 2000 is scheduled for 2004.E-2 Advanced Hawkeye IOC is scheduled for FY 2011.

Developer/Manufacturer: Northrop Grumman, Bethpage, New York and St. Augustine, Florida.

EP-3E
Information Warfare Aircraft
Modification, Improvement, and Sustainment

Description: The EP-3E provides effective information warfare, anti-surface warfare, strike warfare support, and Command, Control, Communications, Computers, Intelligence, Surveillance,and Reconnaissance (C4ISR) capabilities to naval and joint commanders. EP-3Es provide long-range, high-endurance support to aircraft carrier strike groups and expeditionary strike groups in addition to performing independent maritime operations. The current force consists of two active squadrons. The Navy's EP-3E roadmap focuses on three areas: inventory sustainment, modernization, and re-capitalization to provide a force optimized for regional and littoral crisis and conflict.

Inventory Sustainment: A Service Life Assessment Program (SLAP) is in progress. The SLAP will determine what actions must be taken to safely extend the airframe service life. SLAP began in 2000 and the full-scale fatigue test continued into 2003. Final teardown and analysis will be conducted in 2004. The SLAP pre-teardown results (November 2003) were used to define a program of Structurally Significant Inspections (SSIs) that will be modified with data from the teardown analysis. SSIs began in 2003. Lockheed Martin will deliver Individual Aircraft Tracking data in the 2004 that establishes the fatigue life based upon the results of the SLAP analysis and full-scale fatigue test.

The P-3 to EP-3 Conversion Program converts five P-3C Orion aircraft to EP-3E platforms. The conversion program will maintain an inventory of 12 EP-3E aircraft until 2012.

Modernization: The EP-3E Common Configuration Program (CCP) will align the EP-3E mission system to a common baseline that meets the challenge of rapidly emerging threat technology. The CCP will address mission system obsolescence and incorporate "quick reaction" capabilities specifically developed for OEF/OIF. The CCP will also accelerate capabilities developed under the Joint Airborne SIGINT Architecture

EP-3E ➢

Modification (JMOD) program. JMOD capabilities include expanded ELINT and COMINT frequency coverage, improved COMINT Direction Finding Accuracy, and advanced Special Signals Collection capability.

Re-capitalization: The replacement for the EP-3E aircraft will be the Aerial Common Sensor (ACS). See separate program summary.

Program Status: Preliminary SLAP results released in November 2003 for SSI development. The P-3 to EP-3 conversion program will complete fifth and final aircraft in CY 2005. EP-3E CCP for inventory completed by CY 2007.

Developer/Manufacturer: SLAP: Lockheed Martin, Marietta, Georgia.SSIs: developed by Lockheed Martin NADEP Jacksonville. EP-3E Common Configuration Program/EP-3E conversion: L3COM, Waco, Texas.

MK-XII
Combat Identification

Description: Combat Identification is the process of timely and accurately characterizing battlespace contacts to enable rapid, high-confidence shoot/don't shoot decisions with negligible risk of fratricide. The Navy continues to develop Identification Friend or Foe (IFF) Mode 5, a query-and-response cooperative combat identification system replacement for the outdated Mode 4 system. Mode 5 takes advantage of a newly developed NATO-ratified IFF waveform and improved security technology. Based on the Operational Requirements Document (ORD) Joint Interest designation, staffs from OSD, NSA, and all the Armed Services are working together to develop an efficient and effective IFF Mode 4 to Mode 5 transition plan,as well as Mode 5 Concept of Operations.

Program Status: Active contract efforts between the Naval Air Systems Command (NAVAIRSYSCOM), the National Security Agency (NSA), and industry are ongoing to develop a prototype Mode 4/5 capable cryptographic module to support Mode 5 developmental and operational testing in FY 2003. This activity, combined with the organization of a Mode 5 Performance and Test Standards Integrated Process Team (IPT) jointly chaired by the Navy and the DoD AIMS Program Office, will support the Navy's technology insertion plan, beginning in late-2004/early 2005. In addition, staffs from OSD, NSA, and the Services are working together to develop plans for efficient and effective IFF Mode 4 to Mode 5 transition in the years ahead.

Developer/Manufacturer: Mode 5 will be integrated into the fleet via an Engineering Change Proposal (ECP) insertion into new-procurement IFF AN/UPX-37 Digital Interrogators and AN/APX-118 Common Transponders. Additionally, these new Navy hardware sets support cost-effective acquisition practices by providing growth provisions for the emergent Mode S Civil ATC system. Ultimately, the entire fleet of more than 3,000 Navy and Marine Corps aircraft and ships will be equipped with Mode 5.

NavMPS
Naval Mission Planning Systems

Description: NavMPS is a suite of applications that includes: TAMPS (Tactical Automated Mission Planning System), N-PFPS (Navy Portable Flight Planning Software), and JMPS (Joint Mission Planning System). TAMPS is the current Navy-Marine Corps standard unit-level aircraft mission planning system for tactical aircraft. It allows aircrew to perform tactical mission planning at the secret level for a wide variety of aviation platforms, including the F/A-18 Hornet, F-14 Tomcat, S-3 Viking, and E-2 Hawkeye. TAMPS is also used to transfer mission critical flight data from the planning workstations to the aircraft mission computers. Examples of this critical flight data is the loading of overlays for aircraft software and bulk files for missile software, enabling the use of weapons such as the Stand-Off Land Attack Missile (SLAM), Joint Stand-Off Weapon (JSOW), and the Joint Direct Attack Munitions (JDAM). It also allows loading Joint Tactical Information Distribution System (JTIDS) and Global Positioning System (GPS) files into aircraft flight software. N-PFPS is the Navy-Marine Corps standard flight-planning system that covers non TAMPS aircraft. It allows aircrew to plan fuel performance, view and print National Imagery and Mapping Agency (NIMA) charts and it provides a data loader to transfer planning data into the respective aircraft. JMPS will replace both TAMPS and N-PFPS. It is a co-development effort between Navy, Marine Corps, Air Force, Army, and U.S. Special Operations Command. JMPS will bring all stovepipe legacy DoD mission-planning systems under one program with a common framework. The initial investment in the JMPS architecture and legacy system migration should yield significant long-term savings as these systems migrate to JMPS.

Program Status: TAMPS is in production,having reached IOC in 1986. JMPS will begin replacing TAMPS in FY 2004. The final version of TAMPS will be removed from the fleet in FY 2006. N-PFPS versions were fielded in FY 1998, it is scheduled to be replaced by JMPS in FY 2008. JMPS Core Architecture commenced development in 1998, and IOC of the first release is scheduled for FY 2004. Expeditionary warfare planning-capability is scheduled for incorporation into the JMPS architecture during FY 2006 and beyond. Single aircraft planning systems such as TEAMS (EA-6B mission planning) and MPS/MOMS (AV-8B mission planning) will also migrate to JMPS, eliminating several legacy "stovepipe" systems in favor of a single common architecture.

Developer/Manufacturer: TAMPS 6.2.1: BAE, Camarillo, California. N-PFPS: USAF 46TS/TYBRIN, Fort Walton,Florida.JMPS: Northrop Grumman Information Technologies, San Pedro, California.

Submarine Systems

BLQ-10 ESM
Submarine Electronic Support Measures

Description: The AN/BLQ-10 system will be the advanced signals intelligence (SIGINT) system for the *Los Angeles* (SSN-688), *Seawolf* (SSN-21), Virginia (SSN-774), and *Ohio* (SSBN/SSGN-726) classes. It will support operations in both the open ocean and the complex littoral signals environment. The system consists of signal sensors, receivers, displays, advanced processing, and analysis equipment. SIGINT provides detection, identification (including specific emitter identification capability), analysis, and direction finding for radar and communication signals emanating from ships, aircraft, submarines, and other emitters. SIGINT equipment is used by attack submarines to aid in self-protection, situational awareness, and, when augmented with special carry-on SIGINT equipment, intelligence gathering. Additionally, the AN/BLQ-10 system serves as the bridge to disseminate all submarine SIGINT to on and off-hull networks.

Program Status: The AN/BLQ-10 SIGINT System entered development in October 1994. The Engineering Development Model completed an operational deployment onboard the USS *Annapolis* (SSN-760) in 2000. The first backfit production shipset was installed on the USS *Tucson* (SSN-770) in 2001. Systems will be on all deploying SSNs by FY 2008 and all submarines by FY 2012. POM-04 provided additional funding for SSGNS and SSBNS so that all classes can go into one common sigint suite. The total funding required over the FYDP is $388 million.

Developer/Manufacturer: Lockheed Martin, Syracuse, New York.

CSRR
Common Submarine Radio Room

Description: The Common Submarine Radio Room (CSRR) modernizes the radio rooms on *Seawolf* (SSN21), *Ohio* (SSBN-726), and *Los Angeles* (SSN-688)-class submarines based on the Exterior Communications System (ECS) architecture in development for *Virginia* (SSN-774) submarines. The system includes two High Data Rate (HDR) and two OE-538 Multi-function Masts for enhanced wideband connectivity. A common approach to submarine radio room modernization provides the submarine force with full IT21 capability, with the added benefit of common training, common logistics, and common technical insertion.

Program Status: The USS *Virginia* will deliver in FY 2004 with a modern, open-architecture CSRR design.CSRR will be backfitted on all SSNs,SSBNs, and SSGNs by the end of the FY 2004 FYDP.

Developer/Manufacturer: Lockheed Martin, Eagan, Minnesota; NUWC, Newport, RI; SPAWAR, San Diego, CA.

FDS-C
Fixed Distributed System-COTS

Description: FDS-C is a developmental, commercial off-the-shelf (COTS) version of the existing long-term, passive acoustic fixed surveillance FDS system. FDS-C will continue to provide threat

location information to tactical forces and contribute to an accurate maritime picture for the Joint Force Commander, and due to its strategic positioning and long lifetime, will provide indication and warning of hostile maritime activity before conflicts begin.

Both FDS and FDS-C comprise a series of arrays deployed on the ocean floor in deep-ocean areas, across straits and other choke-points, or in strategic shallow water littoral areas. The system is made up of two segments: the Shore Signal and Information Processing Segment (SSIPS) that handles the processing, display, and communication functions and the Underwater Segment consisting of a large-area distributed field of acoustic arrays. FDS-C was developed as a less-expensive follow-on version of FDS by converting to COTS equipment. Taking advantage of advances made in the commercial industry will provide a much more cost-effective FDS-caliber system to meet the fleet's ongoing needs for long-term undersea surveillance. Additionally, the program is pursuing the development of other technologies, such as an all-fiber-optic hydrophone passive array, to further increase system reliability and performance at reduced cost.

Program Status: A contract was awarded in FY 2003 for the production phase for the first of the next generation of underwater systems (FDS-C). Testing began in FY 2003 for all-optical array.

Developer/Manufacturer: General Dynamics, Greensboro, North Carolina; Lockheed Martin Federal Systems, Manassas, Virginia; and Raytheon Systems, Portsmouth, Rhode Island.

HDR
Submarine High Data-Rate Antenna

Description: The submarine High Data-Rate antenna program is a top-priority submarine command, control, communications, computers, and intelligence (C4I) initiative and is the Navy's first multi-band dish antenna. The HDR antenna will provide the submarine force with worldwide high data-rate satellite communications capability. It will enable the submarine to access the secure, survivable Joint MILSTAR Satellite Program in the Extremely High Frequency (EHF) band. It will also provide the capability to receive time critical tactical information from the Global Broadcast Service (GBS). Additionally, the HDR antenna will provide access to the Defense Satellite Communications Sys-tem (DSCS) in the Super High Frequency (SHF) frequency band.

Program Status: The first Rapid Prototype HDR Antenna was delivered to the Navy in June 1998, successfully completed testing on the USS Providence (SSN-719) in August 2000, and was deployed in 2001. Milestone III Decision approval was granted 28 June 2001, following EHF Low Data Rate TECHEVAL and OPEVAL completion. FOT&E for EHF Medium Data Rate, and GBS was completed in FY 2003.SHF FOT&E is scheduled for FY 2005 with the implementation of SHF FOT.

Developer/Manufacturer: Raytheon, Marlboro, Massachusetts.

TIDS
Tactical Integrated Digital System–Phase 3

Description: TIDS Phase 3 is a shipboard tactical network making use of commercial Internet Protocol (IP) communication standards over a fiber optic cable plant, based on upgradeable COTS processors and commercial Open Systems standards. The FORCEnet enabler for submarine tactical systems, TIDS provides both a ship-wide multi-level security LAN and a mission-critical backbone for tactical system communication—tactical control, weapon control, navigation, radar, ESM,imaging, among others—and provides separate TS, SCI, Secret, and Unclassified LANs under the Navy's Integrated Shipboard Network System (ISNS) program.

TIDS will enable ship-to-shore wideband connectivity and battle force interoperability via Internet Protocols. TIDS Phase 3 provides an IP-based connection between the radio room and all tactical systems, eliminating 36 of 38 unique point-to-point interfaces between submarine tactical systems, which results in significant cost savings. The network architecture of TIDS Phase 3 requires only one communication interface for each tactical system. Delivered in accordance with the N6/N77 IT21 Wideband Modernization Plan (WMP), TIDS 3 provides the shipboard distribution piece of the IT-21 WMP and is required for future submarine tactical system modernization. New submarine tactical systems are being developed with only a TIDS Phase 3 interface (no point-to-point interfaces) and thus require TIDS Phase 3 to function.

Program Status: TIDS Phase 3 installations commenced in FY 2004. The first system delivered in this configuration is CCS MK2 Block 1C ECP-4. Installations complete in FY 2011.

Developer / Manufacturer: Lockheed Martin, Manassas, Virginia; EDS, Herndon Virginia; SAIC, Sterling Virginia; and NUWC, Newport, Rhode Island.

Surface and Expeditionary Systems

ACDS
Advanced Combat Direction System

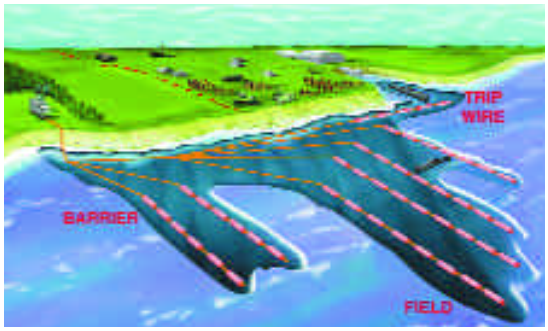
Description: The Advanced Combat Direction System is a centralized, automated command-and-control system. An upgrade from the Naval Tactical Data System (NTDS) for aircraft carriers and large-deck amphibious ships, it provides the capability to identify and classify targets, prioritize and conduct engagements, and exchange targeting information and engagement orders within the battle group and among different service components in the joint theater of operations. ACDS is a core Sea Shield component of non-Aegis/non-SSDS combat systems.

Program Status: ACDS Block 0 is deployed on nine aircraft carriers, five *Wasp* (LHD-1)-class amphibious assault ships, and all five *Tarawa* (LHA-1)-class amphibious assault ships. The first installation of ACDS Block 1 began in FY 1996 with the USS *Eisenhower* (CVN-69). The other Block 1 ships are the USS *John F. Kennedy* (CV-67), USS *Nimitz* (CVN-68), USS *Wasp*, and USS *Iwo Jima* (LHD-7). ACDS Block 1 failed OPEVAL and is slated for replacement by the Ship Self-Defense System (SSDS,see separate

program summary). This process is already underway with *Nimitz* and *Eisenhower* and is scheduled to occur in *John F. Kennedy* and *Iwo Jima* during 2006 and 2007, respectively.

Developer/Manufacturer: Raytheon, San Diego, California. ACDS Block I development, performance, and integration testing: Raytheon; SPAWAR Systems Center, San Diego, California; and the Integrated Combat Systems Test Facility (ICSTF) and Naval Surface Warfare Center Port Hueneme Division (NSWC/PHD), Dam Neck, Virginia.

ADS
Advanced Deployable System



Description: ADS is a rapidly deployable, short-term, large-area undersea surveillance system, designed to detect,locate and report quiet conventional (diesel-electric and air-independent propulsion) and nuclear submarines operating in shallow water littoral environments. The system will also have some capability to detect mine-laying activity and to track surface contacts. ADS will consist of a Processing and Analysis Segment (PAS) that is connected to the ADS sensor field by a shore cable and contained in reusable, transportable vans, and an Underwater Segment (UWS), which is an expendable battery-powered, wide-area field of passive undersea surveillance arrays. ADS will provide threat location information directly to tactical forces and contribute to the real-time, accurate and reliable maritime picture provided to the Joint Force Commander. System segments can be forward-positioned in a standardized, modular ISO-van configuration to allow on-scene forces to deploy ADS rapidly to areas where surveillance is needed to maintain undersea battlespace dominance. By operating in an unobserved, covert fashion, ADS can provide indications and warning of potentially hostile maritime activity well prior to commencement of hostilities. Existing Undersea Surveillance System (USS) processing software and display formats will form the core of the ADS shore signal-processing segment. COTS technologies and NDI are being emphasized to maximize cost effectiveness.

Program Status: ADS is in the Engineering Manufacturing Development phase. In May 1999, an ADS prototype completed a highly successful fleet exercise test by demonstrating the capability to detect and track a quiet diesel-electric submarine and provide real-time cueing information to tactical platforms. A Milestone II decision was granted in February 2000. The program incrementally develops capability beginning with a Barrier in FY 2005, an Off-board sensor in FY 2008, and a Field in FY 2009. This incremental approach was required to remain within existing resources and to meet competing requirements. Congress added funding in FY 2000 to accelerate development of installation capabilities. Congress further increased funding in FY 2001 to accelerate Large Field processing development, and again in FY 2002 to enhance mission-planning capabilities, accelerate system burial, and accelerate development of an all-optical variant of the system.

Developer/Manufacturer: Lockheed Martin Federal Systems, Manassas, Virginia; Raytheon Systems, Portsmouth, Rhode Island; DSR, Fairfax, Virginia; and ORINCON, San Diego, California.

CEC
Cooperative Engagement Capability

Description: The Navy's Cooperative Engagement Capability (CEC) has demonstrated significantly improved battle force air defense capabilities by integrating the sensor data of each cooperating ship and aircraft into a single, real-time,fire-control-quality composite track picture. CEC also interfaces the weapons capabilities of each CEC-equipped ship in the battle group to support an integrated engagement capability. By simultaneously distributing sensor data on airborne threats to each ship within a battle group, CEC extends the range at which a ship can engage hostile missiles to well beyond the radar horizon, significantly improving area, local, and self-defense capabilities. Operating under the direction of a designated commander, CEC will enable a battle group or joint task force to act as a single, geographically dispersed combat system. CEC will provide the Fleet with greater defense-in-depth and the mutual support required to confront the evolving threat of anti-ship cruise missiles and theater ballistic missiles.

Program Status: Initial Operational Capability for the system was declared in FY 1996. TECHEVAL and OPEVAL were successfully completed in 1998–2001 following extensive development and testing of shipboard combat systems with which CEC interfaces. The report of the Commander, Operational Test and Evaluation Force is complete and CEC has been declared both "operationally effective and operationally suitable." In April 2002,the Defense Acquisition Board (DAB) approved Full Rate Production for the AN/USG-2 shipboard equipment sets and Low Rate Initial Production (LRIP) for the AN/USG-3 airborne equipment sets. In September 2003,USD(AT&L) approved FY04/FY05 follow-on LRIP for the USG-3.

As of 2004,CEC is installed on four aircraft carriers,the USS *John F. Kennedy*, USS *Nimitz* USS *Eisenhower*; and USS *Ronald Reagan*; six Aegis cruisers, the USS *Princeton*, USS *Chosin*, USS *Hue City*, USS *Anzio*, USS *Vicksburg*, and USS *Cape St. George*; twelve new construction Aegis destroyers, including USS *McCampbell*, USS *Shoup*, USS *Mason*, USS *Mustin*, and USS *Preble*; six amphibious ships including USS *Wasp* and USS *San Antonio*; and two E-2C Hawkeye 2000 air squadrons, VAW-117 and VAW-125. The AN/USG-3 E-2C Hawkeye 2000 FOT&E-1 was completed in November 2002 and declared "potentially operationally effective" and "potentially operationally suitable"; FOT&E-2 previously scheduled for FY 2003 has slipped to FY2004, results of which will support declaration of achieving CEC Full Operational Capability. FOT&E-3 and FOT&E-4, CEC Software Baseline 2.1 for CVN 69 and LPD 17, are scheduled for FYs 2004 and 2005, respectively.

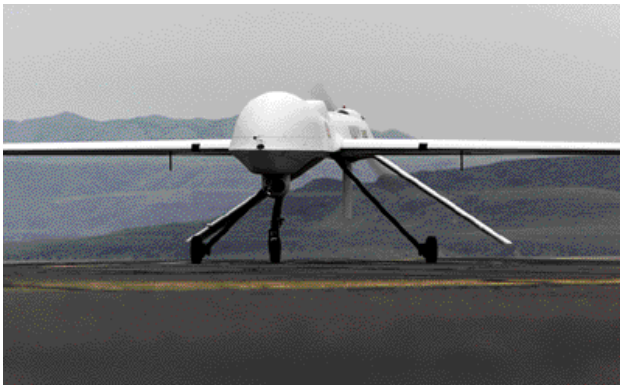
CEC is a spiral development program. Currently, the CEC acquisition strategy is being revised for DAB level review and authorization so that development can proceed. This will help achieve DoD system improvements including overall reduced system cost, size, and weight, less power and cooling, and open network architecture initiatives including SIAP common track management capability and Global Information Grid sensor fusion initiatives. The Navy is also coordinating with Joint Staff

and OSD to explore potential multi-service avenues for CEC capability implementation that will expand sensor netting track data availability to meet a variety of warfighter needs across various platforms (e.g., ships, aircraft, land sites and vehicles).

Developer/Manufacturer: Johns Hopkins University, Applied Physics Laboratory, Laurel, Maryland; and Raytheon Systems Company, St. Petersburg, Florida.

TCS
Tactical Control System

Description: The Tactical Control System (TCS) is a joint system that offers the warfighter a common core operating environment to receive, process, and disseminate UAV data from two or more different UAV types for reconnaissance, surveillance, targeting, and combat assessment. TCS provides interoperability and commonality for mission planning, command and control, and C4I interfaces for Tactical- and Medium-Altitude Unmanned Aerial Vehicles (UAVs), including the Army SHADOW 200 Tactical UAV, the Navy/Marine Corps Fire Scout Vertical Takeoff and Landing (VTOL) Tactical UAV (VTUAV), and the Air Force and Navy Predator UAV. TCS will be integrated with TSC to support the Navy Global Hawk Maritime Demonstration System (GHMD) and Broad Area Maritime Surveillance (BAMS) UAV. TCS provides a full range of scaleable UAV capability, from passive receipt of air vehicle and payload data to full air vehicle and payload command and control from ground control stations both ashore and afloat.



Program Status: Milestone II was successfully completed in February 2000. TCS flight-testing was initiated in FY03 and continues in conjunction with the VTUAV (FireScout) Program. TCS will be integrated, tested, and fielded in accordance with the schedules of various UAV programs:

- **Firescout testing TCS flight-testing was initiated in FY03 and continues in conjunction with the VTUAV (FireScout) Program.**
- **Pioneer Improvement Program (PIP) in the fourth quarter FY 2004**
- **Predator level IV with Joint Operational Test Bed System (JOTBS) in the fourth quarter FY 2004**
- **Incorporate Fire Scout, Shadow, Predator and PIP functionality into a single GCS in the fourth quarter FY 2004**
- **Global Hawk level IV in support of GHMD program in the third quarter FY 2005**
- **BAMS level V to be determined**

Developer/Manufacturer: System Integrator, Raytheon Systems Inc. Falls Church, Virginia.

Sea Warrior

Sea Warrior is the cornerstone initiative that will strategically align the Navy's human resources alongside mission accomplishment and systems development and design. It combines a continuous career management, growth and development centered perspective on the Sailor (active and reserve) and civilian workforce that is critical and relevant to the Navy's overall mission. Mission accomplishment through active participation by the Navy's force of professionals is the key concept of Sea Warrior.

Total Force Management

The Navy's military personnel strategic focus and initiatives are paying off. The Navy has far exceeded its retention and recruit quality goals for Enlisted personnel while Officer retention was the highest in well more than a decade. This was a direct result of a deliberate strategic focus and efforts targeted across the entire manning spectrum. Attrition rates remain at historical lows with retention levels of quality enlisted and officer personnel exceeding the high levels experienced in the past two years. These excellent retention levels enjoyed over the last several years resulted in a high state of personnel readiness enabling the Navy to meet emerging requirements from the Global War on Terrorism and to successfully prosecute the war in Iraq.

Continued emphasis on recruit quality and priority rating requirements has ensured a strong inventory from which to shape and transform Navy Manpower. The Selective Reenlistment Bonus (SRB) continues to be the single most successful tool for shaping the enlisted force. The employment of the Perform-to-Serve Program for First Term Sailors will enable better alignment of personnel and encourage migration into undermanned critical skills. Within the Officer Corps, targeted programs such as Nuclear Officer Incentive Pay, Surface Warfare Officer Career Incentive Pay, and Aviation Incentive Pay continue to enable retention of critical URL officers and ensure adequate manning levels at specific career points.

We have made great progress toward shaping the force profile and aligning personnel inventory to requirements at all points along the length of service (LOS) axis,however, additional effort will be needed as we transform the force. The Enlisted Force profile still suffers from severe imbalances within individual ratings with deep shortages across the LOS axis. Transformation challenges will require even greater focus, energy and resources in recruiting, training and retaining the highest quality professionals. The Navy must continue to commit the necessary resources to minimize personnel gaps, which will become critical in achieving a culture of readiness and rapid response. Future success in retention of high-quality Officers and Sailors will require Navy's continued strong commitment to targeted retention incentives.

The civilian component faces many of the same challenges as a significant portion of the workforce is nearing retirement age. As a result of recruiting fewer young, technically oriented people in

recent years,the Navy's workforce is facing a potential shortage of experienced people in the out-years. This challenge is being successfully minimized through the application of proven methods and innovative new programs.

Balancing the Force profile with quality people, both within and among ratings (skill and experience mix), is a primary focus of the Navy's personnel strategy. The de-aging of the force, one result of the drawdown policies of the 1990s,mandates devotion of significant resources to retention efforts in specific LOS cohorts as well as individual ratings. Additionally, technological advances in Navy systems require higher quality and more experienced Sailors to succeed in a more complex environment.

Manning Next-Generation Warships

As the Navy readies to construct new warships such as DD(X) and LCS (see separate DD(X) and LCS program summaries), conserving affordability and still maintaining the highest operational effectiveness have generated a holistic, system-of-systems approach to minimize total ownership costs throughout the lifetimes of these future warships. Indeed, optimizing DD(X) and LCS crews has meant that these programs started with a "clean-sheet-of-paper"approach to surface warship manning. In light of this, the Navy is approaching the future Surface Combatant Family of Ships programs with the Sailors' needs and capabilities fully taken into account,up front,in systems and ship design,well before construction begins.

In order to ensure that these and other new-platform programs' optimal-manning goals can be met, the Navy is addressing the need for changes in manning and training processes and policies to take full advantage of system automation and improvements in shipboard processes. To that end, manpower specialists are working closely with engineers, scientists, researchers, and designers to ensure that they are taking a human-centered approach to meeting manpower and warfighting requirements.Likewise, training experts are focusing on the expectation that Sailors walk onboard a future DD(X) as "full-up rounds," already fully qualified to do their jobs in an individual and team-centered approach. This philosophy is shaping the Navy's approaches to LCS,DDX, and CG(X) warships, and has application throughout the service. Indeed, the need to address current and future training needs was the focus of the CNO's Executive Review of Navy Training (ERNT), completed in the summer 2001, and the continuing efforts of Task Force EXCEL (Excellence through Commitment to Education and Learning).

The Navy has established an enterprise approach, known as SEAPRINT (Systems Engineering, Acquisition, and Personnel Integration), to ensure that this philosophy is integrated into all new acquisition programs.SEAPRINT is a clearly articulated philosophy that includes specific program management controls and a technical process designed to ensure that human considerations are adequately and timely addressed. SEAPRINT integrates the Sea Warrior initiatives into the acquisition process to create a proactive environment where manpower, personnel and training concerns are design drivers vice consequences

Only by embracing a human-centered philosophy that transcends virtually every element of the Navy will we be able to ensure our future warships and other platforms can go in harm's way and emerge victorious. As the CNO detailed in his "Sea Power 21" vision, the Navy needs to emphasize "the human factor in the development of advanced technologies. This philosophy acknowledges that the [Sea] Warrior is a premier element of all operational systems."

Recruiting

The mission of Total Force Recruiting is to access high-quality men and women into the U.S. Navy and Naval Reserve. Headquartered in Millington, Tennessee, the Commander, Naval Recruiting Command (CNRC) has cognizance over five major commands. Four of the regional commands are responsible for recruiting active duty personnel,and Naval Reserve Recruiting is the fifth major command.

The Navy's recruiter force is focused in several areas,all designed to provide the fleet with the highest quality recruit, optimal Recruit Training Command (RTC) phasing, and specific requisite skill sets. Major recruiting program components include field recruiters with associated support,local and national advertising, and enlistment incentives. As a result of judicious allocation of resources, investment in technology and training, and hard work in the field, the Navy has achieved its accession mission for the past five years.

A continued weak economy and high unemployment throughout FY 2003 supported a favorable active recruiting environment. With fleet retention reaching record levels, a reduced accession mission was given to Navy Recruiting in FY 2003. CNRC used this historic opportunity to focus on improving the quality of each recruit, tightening standards and raising enlistment requirements where applicable. As a result, 94.3 percent of all accessed recruits in FY 2003 were High School Diploma Graduates (HSDG), and 65.8 percent of new accessions scored in the upper half of the Armed Forces Qualification Test (AFQT). These improvements were made even as recruitment funding resources remained constrained and the service reduced the number of recruiters for the second consecutive year. The lower accession mission also allowed for greater flexibility in meeting specific goals, such as recruiting 103.3 percent of the General Detail (GENDET) goal, which accounted for more than one-third of the annual recruiting mission. Recruits in FY 2003 spent an average of six months in the Delayed Entry Program, where they learn physical fitness and Navy knowledge, allowing them to be better prepared for Recruit Training Command, Great Lakes. Focused leadership and training in the Delayed Entry Program has had a positive effect on RTC attrition.

In an effort to meet the needs of an increasingly technical fleet, Navy Recruiting has made it a priority to improve upon its college-experience recruiting efforts to address the projected requirements determined by the Strategic Studies Group (SSG) at the Naval War College, which forecasted an increased need for more college-experienced recruits. Navy Recruiting surpassed its goal of 3,000 recruits with at least 12 semester hours of college in FY 2003, and is working to increase that number in FY 2004. Naval Reserve Recruiting

was successful with more than 106 percent attainment of its enlisted accession mission. However, despite achieving the volume of enlistments required, some ratings, most notably Hospital Corpsman, fell short of their FY 2003 goal. As a result of the continued record high retention of Active duty personnel, the available prior-service recruitable population was reduced, forcing Navy Reserve recruiting to increase further its penetration into the Non-Prior Service market. This has a negative impact on the readiness level of the Reserve force as these recruits do not always have the requisite training required to be readily deployable.

The combination of innovation, hard work, and available resources has continued to yield significant gains in Navy recruiting. Even with the media coverage of Operation Iraqi Freedom and Enduring Freedom,no change in the propensity to enlist has been realized through early 2004. In light of this and with the projected decrease in the number of "influencers" with military experience (e.g., parents, coaches, relatives), the current level of propensity to enlist may continue or even decline. Additionally, economic assumptions from the FY 2005 President's Budget show civilian unemployment rates at 5.6% for 2004, 5.4% fro FY 2005, 5.2% for 2006, and 5.1% for FY 2007 through FY 2009, which will pose significant challenges for military recruiting. To counteract these impending market changes and prevent a retreat from the quality gains of the past two years, Navy Recruiting is developing a series of responses to meet these tougher conditions, including enlistment incentives, advertising, and recruiter training. Additionally, Navy Recruiting is in the process of determining leading indicators to identify changes in the market, allowing for increased response time.

In the area of Officer Recruiting, Navy achieved 100 percent of Unrestricted Line (URL), Restricted Line (RL), and Staff officer missions. The medical field continues to prove challenging. However, only the Dental Corps mission was missed in FY 2003. Reserve Officer recruiting fell short of its goal, largely in designators requiring fleet experience (i.e., Surface Warfare Officer, Pilot),as well as some medical specialties.

Officer Diversity was a top priority in FY 2003,and the increased focus led to an 18 percent improvement in active officer new contract diversity, and a 38 percent increase in reserve officer new contract diversity. Navy Recruiting has set a goal of achieving 25 percent diversity in officer new contracts. To assist in achieving this goal, Navy has improved its corporate sponsorship of minority organizations and has increased the attendance by the fleet at minority conferences and workshops. CNRC has also increased partnership with historically Black universities and Hispanic serving institutions.

While Navy Recruiting is enjoying its current success, we are also working to position ourselves for a potentially difficult recruiting market in the future.

Retention

The CNO established Manpower as "Number One" on his "Top Five" list of priorities, and his "Sea Power 21" vision is focused on

creating a Navy in which all Sailors are optimally assessed, trained, assigned, and sustained. This is routinely emphasized to all levels of Navy leadership, as is the strong commitment to readiness and quality of service. Initiatives such as Smart Recruiter, Smart Work, and SmartShip reflect the value Navy leadership places on sailors and the importance of convincing them to "Stay Navy." Positive, personalized leadership and mentoring combined with a variety of innovative programs have resulted in appreciable increases in aggregate reenlistment rates in FYs 2001-2003. This has been most noticeable among the critical first-term enlistment population where the reenlistment rate increased by nearly 19 percent. This dramatic turn-around demonstrates the combined effects of leadership involvement in professional development, expanded reenlistment bonuses, enhanced special and incentive pays, increases in advancement opportunity, and significant quality of service improvements. While these increases remain short of long-range, steady-state retention goals for more senior personnel, they represent a major step in the right direction and most significantly, have reversed the downward trend in retention exacerbated by a decade-long draw-down during the 1990s.

Even though overall Navy retention behavior is excellent, certain critical ratings show current or future shortages in their respective rating profile. Many of these critical ratings are in high-tech specialties, for which it has been difficult to recruit and retain talented personnel. Specific rating shortfalls have resulted in chronic skill mismatches. Despite targeted efforts to more effectively recruit critical ratings and improve recruiter productivity with the use of Enlistment Bonus and Navy College Fund, several critical ratings continue to be under-accessed.

Significant shortfalls exist in many ratings in year groups between five and 14 years of service and illustrate the micro-effects of under accessing during the draw-down years. The Navy can never replace the lack of accessions in these cohorts; therefore, Navy must continue efforts to retain as many of these Sailors as possible. The Selective Reenlistment Bonus (SRB) is the key tool in this area. Additionally, more Sailors beyond the 14-year point must be retained. Although not perfect substitutes, Sailors in LOS 14+ can compensate in the short-term for the shortfalls in the 7-14 LOS range. Programs such as Special Duty Assignment Pay and Assignment Incentive Pay can effectively target and incentivize Sailors beyond the 14-year point.

Another avenue to solve rating imbalances is to encourage as many Sailors as possible to convert from over-manned ratings to under-manned ratings. The Lateral Conversion Bonus is a new initiative that will encourage migration of Sailors in over-manned ratings to under-manned ratings.

Balancing the skill mix remains a key focal point of Navy's personnel strategy. Without continued efforts to correct critical rating imbalances, Navy runs the risk of developing a military force profile lacking the experience and skills necessary to meet increasing technical demands of the present and future. Consequently, the Navy is committed to reducing critical rating shortfalls by resourcing programs which retain Sailors with critical skills as well

as programs that encourage migration from over-manned ratings to under-manned ratings. Proven programs such as the Selective Reenlistment Bonus, and Special Duty Assignment Pay (SDAP), as well as new programs such as the Lateral Conversion Bonus (LCB) and Critical Skills Retention Bonus (CSRB) are focused on retaining the right Sailor with the right skills.

Center For Career Development

One of the most successful elements in supporting the Navy's battle for people is the Center for Career Development (CCD). Established in 2000, CCD has become the centerpiece of the Navy's focus on retention. CCD collects feedback from the Fleet and acts as the conduit for integrating their issues in the formulation of retention policy. It funnels energy and resources toward meeting retention challenges and provides the Fleet with the necessary tools to strengthen retention efforts. These tools include enhanced professional training for Navy career counselors and retention teams,career management symposiums for Sailors and their families, and comprehensive, easy-to-use interactive products using the latest information technology. Career management symposiums are an excellent example of how aggressively the Navy is engaged in the fight to keep high-quality Sailors. The symposiums take a multi-pronged approach to educating Sailors on their career choices. For example, it provides Sailors with direct comparisons of total Navy compensation with that of civilian counterparts. They also provide an opportunity for Sailors to meet face-to-face with detailers who can discuss career options, conduct community status briefs, and even negotiate orders. Perhaps most importantly, CCD provides career management briefs to leadership teams, Navy leadership schools

And quarterly "CNO's Best Retention Practices" messages to share Fleet retention initiatives. Since its inception, the CCD has visited 97 locations , interacted with more than 114,000 Sailors and family members, and convinced hundreds of members to reenlist who would have otherwise separated at the end of their obligation.

Selective Reenlistment Bonus

In FY 2003, the SRB program experienced yet again another successful year with 18,497 reenlistments. More importantly, long-term commitments (five- and six-year contracts) continued to increase—a major step in locking in future talent and ameliorating the effects of a younger force. Future success in retention will result from the Navy's continued strong commitment to SRB and an increased focus on retention in those groups not entitled to the bonus.

As the Navy moves ahead, progress in retention will continue to be effected through innovation. Additionally, in the effort to more directly focus on shaping the force, the SRB program started to shift the focus from the generalized skill level (ratings) to target the more specialized numbered skill (NEC).

Redesign of the Naval Reserve

In October 2003, Commander, Fleet Forces Command (CFFC) directed a Zero-Based Review (ZBR) of capabilities that can be

filled by the Navy's Reserve Component (RC). The RC will provide direct and indirect support to active units engaged in training, deploying, or surging within one of the 14 "Sea Power 21" mission capabilities and in support of the Fleet Response Plan (FRP). Several initiatives have been identified to redesign and shape the future Naval Reserve:

- **Flexible service contracts are under development to provide a broader spectrum of participation levels, tied to the mission needs of the unit and associated billets.**
- **Naval Reserve recruiting policies and programs are b eing adjusted to expand recruiting into the high school market,and providing full Boot Camp and A-school training upon accession.**
- **Reserve Activity tours are being integrated into the Active Duty career tracks, while Full Time Support (FTS) personnel will get more fleet tours.**
- **By assuming "Additional Duty" reporting senior authority for the Naval Reserve Force,CFFC has assumed readiness and training responsibility for all Selected Reserve (SELRES) personnel.**

The Naval Reserve was an active participant in the Global War on Terrorism in 2003, peaking with more than 12,000 personnel mobilized in support of Operation Iraqi Freedom. Although that number has been reduced since major combat operations ceased in May 2003, in early 2004 nearly 2,000 Naval Reservists remained mobilized in support of worldwide operations— Marine Corps medical support, overseas port security, port cargo handling operations, logistic airlift support, Combatant Commander staff augmentation, and CONUS force protection. The Naval Reserve is demonstrating its relevance on a daily basis, and by adapting to a changing world, will remain a key part of tomorrow's Navy.

Quality of Service

The mission of Navy Morale, Welfare and Recreation (MWR) is to provide high quality support and recreational services that contribute to retention and readiness by improving the mental, physical,and emotional well being of our Sailors.MWR enhances Quality of Service for Sailors and their families by providing a variety of programs promoting recreation, social,and community support activities on Navy facilities worldwide. MWR programs provide active-duty, reserve and retired Navy personnel and their families with sports and physical fitness activities, outdoor recreation, value priced tickets to entertainment and tours, and a variety of food and beverage services. Additionally, child development and youth programs provide safe, affordable and quality childcare for more than 47,000 children of Navy families.

Deployed Recreation

Navy MWR also provides direct support to Commanders deployed in support of the nation's War on Terrorism. Every ship is outfitted with a full complement of state of the art fitness, recreation and library equipment. Afloat recreation and

fitness coordinators are embarked with most deployed aircraft carrier strike groups and expeditionary strike groups to provide physical fitness and stress-relief opportunities, significantly contributing to improved readiness and morale. As an added benefit, Sailors at sea and in remote forward areas are provided a large library of movies on videotape and DVD and are now seeing motion pictures within a very short time after their release in theaters stateside.

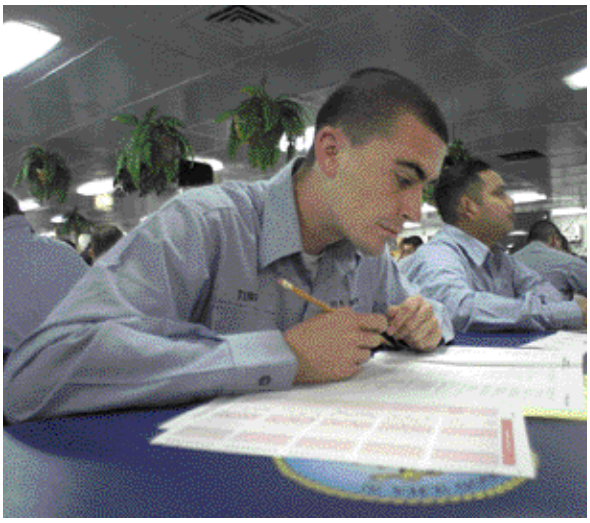
Family Support

On the home front, the Navy's Fleet and Family Support Program (FFSP) ensures Sailors and their families are ready to meet the challenges of deployments by providing pre-, mid-, and post-deployment programs for use by unit commanders. FFSP is also enhancing its spouse-employment program by providing career training and expanding linkage to employment opportunities. Other major FFSP programs include personal financial management, family advocacy, transition assistance, and relocation assistance—crisis intervention; and individual,martial and family counseling all of which have a direct and positive link to readiness. FFSP programs are accredited by Navy-wide system of quality and service delivery standards. FFSP programs are delivered at 77 sites worldwide. Program usage data will be automated beginning in late FY 2004 using the new Fleet and Family Support Management Information System. The Navy will be augmenting current center-based services in FY 2004 by offering Navy OneSource, a contract information and referral service, to expand support services to members and families of reserve, recruiting and remote assignment personnel and those requiring "24/7" access by providing 1-800 phone and internet information services.

Key Sea Warrior Programs

EMPRS
Electronic Military Personnel Record System

Description: EMPRS is the Navy's solution to the DoD initiative to standardize military personnel record management. It is a digital image-based record management system serving as the repository for all active, reserve, and retired Navy officer and enlisted records. EMPRS supports the functions of career management, promotion, assignment, casualty management, mobilization, and readiness. It is also used to satisfy personnel data requests by local, state, federal, and congressional agencies. In the future, the military personnel record will be expanded to include business functions and processes supporting the entire military personnel lifecycle, with an infrastructure permitting multiple levels of access to that record (e.g., corporate, field, member). This will move EMPRS significantly towards a "paperless" environment that can be managed across multiple networked architectures (e.g., WWW, LANs, WANs, MANs). Corporate record management, enabled by EMPRS, NSIPS, and eventually DIMHFSwill allow the appropriate Functional Area Manager (FAM) of a particular personnel function and the member to update and view content of the military personnel record.



EMPRS ➢

Program Status: EMPRS began a technology refreshment project in March 2003. The upgrade will insure a more stable, reliable, and flexible system is in place to support personnel management functions in both DIMHRS and Sea Warrior initiatives. Major components of the upgrade include IBM Content Management, eRecords COTS applications, and EMC storage equipment. The upgraded system includes the capability to "fail-over" operations to a geographically separate location in the event of an emergency in the prime operational location. The upgraded system will be operational in January 2005.

Developer/Manufacturer: SAIC-CST Business Unit, IBM, EMC, and CACI. Operations and Maintenance of the existing and updated EMPRS: SAIC-CST Business Unit Huntsville, Alabama. Program management support for EMPRS: CACI, INC Federal Arlington, VA. Contractor developing and installing refreshment of the main EMPRS document repository and Selection Board decision support application: IBM Business Consulting Services, Federal Bethesda, MD

DIMHRS (Pers/Pay)
Defense Integrated Military Human Resources System

Description: The Defense Integrated Military Human Resources System (Personnel and Pay) (DIMHRS (Pers/Pay)) Program is an Acquisition Category (ACAT) I AM program designed to transform the way the Services conduct the business of managing their Human Resources (HR). Based on the needs identified in the Mission Need Statement (MNS) that was approved by the Under Secretary of Defense for Personnel and Readiness (USD (P&R)) on 24 February 1998, DIMHRS (Pers/Pay) will provide the Department of Defense (DoD) with a single,fully integrated,all-Service,all-Component,military personnel and pay management system. DIMHRS (Pers/Pay) will collect, store, pass, process, and report personnel and pay data for these personnel. In addition, DIMHRS (Pers/Pay) will provide the capability to collect, process,and report appropriate data on DoD-sponsored civilians and designated foreign military personnel deployed to, or in, a theater of operations as required during specified contingency, wartime, and non-combatant evacuation operations. DIMHRS (Pers/Pay) will accommodate up to a 33 percent surge in records maintained. The system will maintain personnel information on approximately 3 million retirees and survivor personnel.

DIMHRS (Pers/Pay) will transform military personnel and pay management processes and will be the largest personnel and pay system in the world, in both scope and number of people served, and will replace more than 80 legacy systems, including the Navy Standard Integrated Personnel System, which is scheduled to migrate in FY 2007. (See separate program summary for NSIPS below).

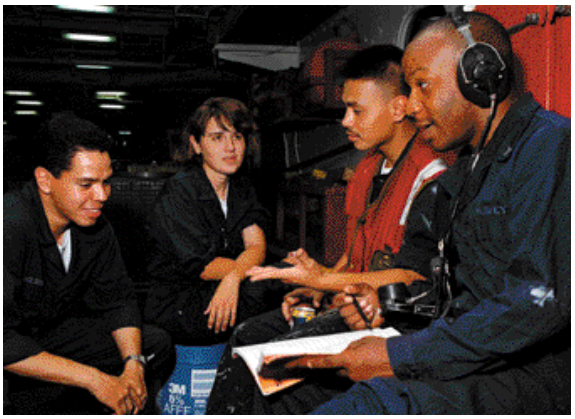
Program Status: DIMHRS (Pers / Pay) achieved Milestone 0 on 27 February 1998 and Milestone 1 on 27 October 2000. On 28 May 2003, the Program was approved for System Development and Demonstration, Milestone B. In the Milestone B ADM, the Program was given authority to purchase and deploy assets

required to support Development Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E). Army implementation will be first followed closely by Navy, Air Force and US Marine Corps with IOC NLT March FY06 and FOC achieved in FY07.

Developer/Manufacturer: During the Milestone I review, the Overarching Integrated Product Team (OIPT) authorized the Program to release a Request for Proposal (RFP) and then award a one-year DoD enterprise license for a Commercial-Off-The-Shelf – Human Resource (COTS HR) product and associated services to evaluate the product. Subsequently, an RFP was released and through full and open competition PeopleSoft USA, Inc. was awarded the contract. On 26 September 2003, the contract option for development and implementation was exercised on the Northrop Grumman Information Technology (NGIT) contract and NGIT became the system developer and implementer. NGIT is currently in detailed design with a CDR planned for August 04.

NSIPS
Navy Standard Integrated Personnel System

Description: The Navy Standard Integrated Personnel System is a major automated information system designed to integrate Active, Reserve, and Retired military personnel systems within the Navy. It will improve the military personnel tracking process, consolidate processes and systems within all areas of military personnel, and replace the functionality of four legacy source data-collection systems. NSIPS will deliver field-level pay and personnel data to update corporate databases in peacetime, as well as during recalls, and during both partial and full mobilization. Most importantly, NSIPS will collect, pass, and report timely, accurate data on Active, Reserve and Retired Navy members in the continental United States, overseas, and onboard ships. NSIPS will have the capacity and flexibility to satisfy customer and user needs at all levels. In addition, it will have the capability to support current and future business processes.



Program Status: NSIPS achieved Milestone I on 16 May 1997 and Milestone II on 6 January 1998. Release 0 was deployed in February 2000 and is currently in use at all Reserve activities. Release 0.2 adds Active duty personnel functionality, and Milestone III for Release 0.2 was achieved on 28 September 2001. Milestone IIIA, Release 1 (IOC estimated December 2003) will integrate active-duty pay functionality. IOC for NSIPS has been moved to June 2004, pending final MDA decision.NSIPS has also been web-developed and released to the Naval Reserve. Pending IOC for Release 1.0, NSIPS Web version 1.1 will be deployed to active duty CONUS sites and there are plans to update ships starting September 2004.

Developer/Manufacturer: Lockheed Martin; SPAWAR Information Technology Center, New Orleans, Louisiana, and various other continental U.S. locations; Applied Computer Services, Inc., and System Engineering and Security, Inc., New Orleans, Louisiana.

T-6A JPATS
Joint Primary Aircraft Training System

Description: The T-6A Texan II is a joint Navy-Air Force aircraft designed to replace the existing Navy T-34C and the Air Force T-37 aircraft. The JPATS program consists of the T-6A aircraft, Aircrew Training Devices (ATD) and Training Integrated Management System (TIMS), which will manage all Ground-Based Training Systems (GBTS) and administrative requirements for flight student activities. The Navy will use this new training system for primary undergraduate pilot and Naval Flight Officer (NFO)/Air Force navigator training. In 1996, the Navy assumed responsibility for training all Air Force tactical navigators.

Program Status: Air Force is the lead service for JPATS. The program passed Milestone III full-rate production in December 2001. The first production T-6A was completed in 1998 and was delivered to Air Force in November 1999. The Navy accepted the first T-6A in November 2002 in Pensacola, Florida. The service will acquire 49 T-6As through FY 2004 and will use them for primary NFO/navigator training. The first class started in the third quarter FY 2003. The Navy will resume procuring T-6As in FY 2007 to replace T-34s for primary pilot training. Air Force and Navy are scheduled to procure 782 aircraft, with the Navy portion of the procurement totaling 328 aircraft. The GBTS, with its Training Integrated Management System, is scheduled to be operational for both services in 2003. Navy will resume procuring T-6As in FY 2007 to replace T-34s for primary pilot training. Air Force and Navy are scheduled to procure 782 aircraft with the Navy portion of the procurement totaling 328 aircraft.

Developer/Manufacturer: T-6A Aircraft: Raytheon, Wichita, Kansas. GBTS: Flight Safety Service Corporation, Littleton, Colorado.

T-45TS
Undergraduate Jet Pilot Training System

Description: The T-45TS (Training System) provides Naval Aviation with a totally integrated jet pilot training system combining computer-based academics, simulators, T-45A and T-45C Goshawk aircraft, and contractor-supplied maintenance and logistics support. The T-45 series aircraft replaces the T-2C and TA-4J trainer aircraft. The T-45TS represents the first time the Department of Defense has applied such a total training system concept to training aviators.

Program Status: The T-45TS is operational at Naval Air Station (NAS) Kingsville, Texas and NAS Meridian, Mississippi. Procurement of the newest T-45 series aircraft, the T-45C (digital cockpit configuration), with associated ground-based training systems and support, continues with 15 aircraft in FY 2004, and ten aircraft planned for FY 2005. A T-45TS avionics modernization program will commence in FY 2005. This program will correct several obsolescence issues and upgrade all T-45 aircraft to a digital cockpit configuration. The first delivery of the T-45C to NAS Kingsville, Texas should occur once the 90th T-45C aircraft is delivered to NAS Meridian, Mississippi in September 2004.

Developer/Manufacturer: Boeing, St. Louis, Missouri; and Rolls-Royce, Bristol, United Kingdom.

CHAPTER 4

FISCAL OUTLOOK

Readiness, advanced technology, dominance of the maritime domain, and the genius of our people are the U.S. Navy's asymmetric advantages over America's adversaries. Today's Sailors and Marines are better trained and equipped than they were just a few years ago. The Navy intends to accelerate these advantages while maintaining the course set by "Sea Power 21". The Navy's investment and commitment toward readiness have paid off - our forces can now deploy sooner, for longer periods of time, and sustain a higher rate of operational availability than ever before. The Navy stands ready to deliver superior combat power to the far corners of the earth.

Department of Defense enhancements to FY 2003 and 2004 annual budgets provided increases in Total Obligational Authority (TOA), and allowed the Navy to address additional program needs related to the security and defense of our homeland. The positive trend continues in the President's FY 2005 DoD budget request for $401.7 million, an increase of seven percent over FY 2004. The new budget request includes $119.4 billion for the Navy, an increase of $5 billion (4.5 percent) compared to last year.

Navy Resources

In the coming year, the Navy will continue the effort to sustain necessary gains in readiness, deepen the growth and development of our people, and accelerate investment in the Sea Power 21 vision. Combined with efficiencies harvested from technological innovation and improvement, these efforts will enable the achievement of unprecedented maritime power for the future needs of America. The Navy's Total Obligation Authority (TOA) request for FY 2005 is $102.4 billion, and represents an increase of approximately 5.6 percent from FY 2004. Figure 10 illustrates projections of 33 percent real growth through FY 2009,a dramatic turnaround of the downward trend in Navy TOA between 1990 and 2001. The achievement of the "Sea Power 21" vision depends on the continuation of that real growth.

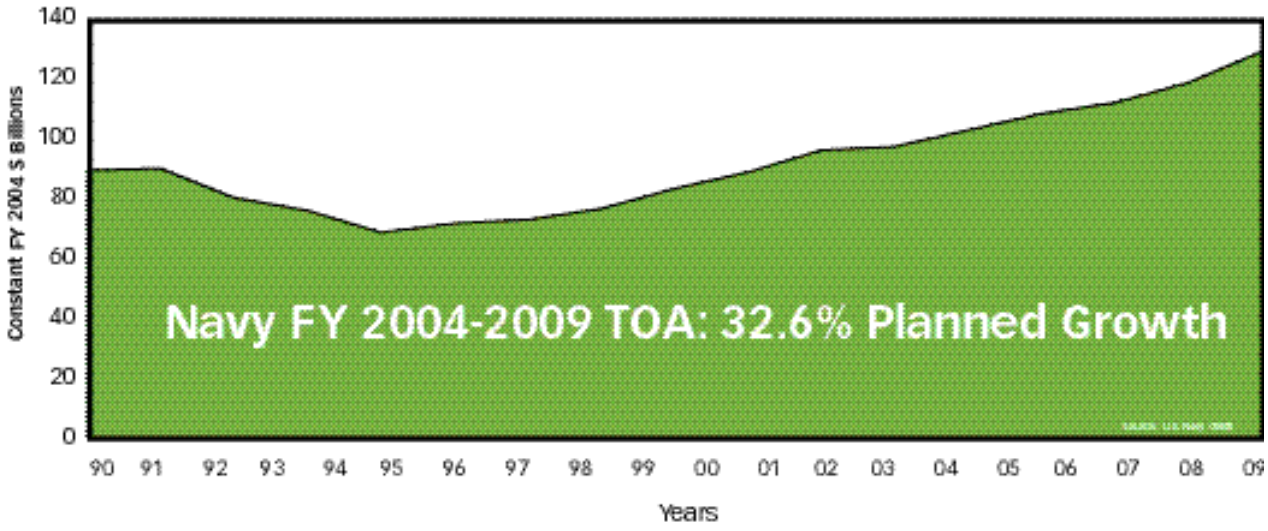


FIGURE 10 | Total Obligational Authority, FY 1990-2009

Delivering the Right Readiness at the Right Cost

Readiness is the catalyst that brings combat power to bear whenever it is needed. It is the genuine return on investment due to the American public. This year's budget request accurately reflects the Navy's readiness needs, assesses risks to investments, and provides resources necessary for leadership to deliver operational capabilities. These capabilities depend upon ship operations and aircraft flying hours, maintenance, training, and modernization of shore installations. If the Navy budget is fully funded, the result will be a measurable improvement in our ability to surge in crisis and sustain readiness during longer deployments.

Shaping the 21st Century Workforce

The Navy is fully committed to pursuing competitive personnel policies and new technologies to streamline combat and non-combat personnel positions, as well as improving the

integration of active and reserve components, and reducing the Navy's total manpower structure. Appropriately, the FY 2005 budget request proposes a reduction of 7,900 people. The Navy workforce also must be better educated to adapt to the increasing pace of change in technology. The goal is to attract, develop, train and retain the most highly skilled and educated workforce ever assembled, and provide every Sailor a rewarding life experience.

Accelerating our Investment in Sea Power 21

"Sea Power 21" defines the capabilities the Navy will deliver to meet future challenges. Recent investments by Congress have provided the opportunity to accelerate the advantages toward a joint, networked, sea-based force. This year, the Navy will seek to revolutionize existing capabilities through distributed and networked technology. The primary focus will remain on the power of Sea Basing and complementary alignment with joint partners, especially the U. S. Marine Corps.A robust science and technology program will bring to bear investments made in joint research and development to better support the warfighter in the battlespace. Future investments will aim to exploit the largest maneuver space on the face of the earth: the sea.

The Navy will also continue to maintain its multi-mission capabilities and forward-presence posture, while stabilizing the size of the Fleet and reducing shore-based support infrastructure. Figure 11 shows the realities in force structure size and mix proposed through FY 2009, with more modern and more capable ships and aircraft available, though in reduced numbers.

Ship Types	FY 93	FY 00	FY 09
Aircraft Carriers	13	12	12
Cruisers	52	27	22
Destroyers	39	54	57
Frigates	59	27	21
Littoral Combat Ships	0	0	4
Ballistic Missile Subs	24	18	14
Attack Subs	88	56	57
Guided Missile Subs	0	0	4
Amphibious	54	39	37
Mine Warfare	12	11	11
Support Ships	51	25	17
Logistics Ships	50	34	37
Mobilization Forces (NRF)	18	16	15
Total	460	317	308
FY 1993-2007 Reduction: -155 Ships (33.7%)			

Aircraft Category	FY 93	FY 00	FY 09
Power Projection	1213	940	1146
Tactical Support	737	500	843
Anti-Submarine Warfare	566	416	406
Electronic Warfare	154	141	132
Logistics Support	491	379	134
Training	1236	1193	736
RDT&E	220	202	22
Other	87	11	19
Total	4704	3782	3458
FY 1993-2007 Reduction: -709 Aircraft (15.1%)			

FIGURE 11 | Force Structure Trends

Navy Appropriations

The allocation of requested FY 2005 Navy resources to appropriations is shown in Figure 12. These appropriations are grouped to simplify the display (e.g., personnel, shipbuilding, aircraft procurement, research and development, operations).

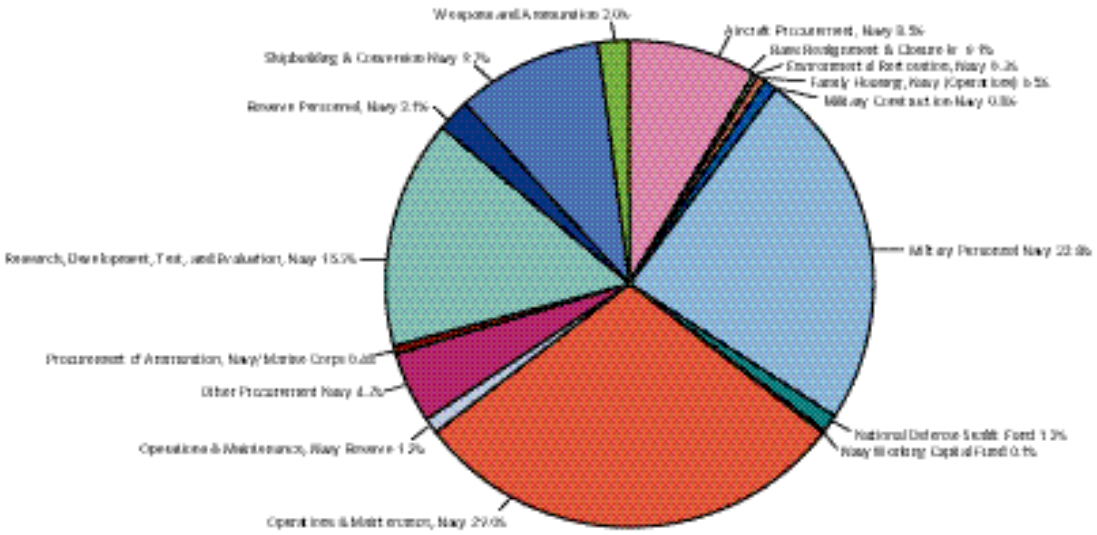


FIGURE 12
FY 2005 DoN Budget Request by Appropriation

Vision…Presence…Power

Today's Navy is the most capable and most ready in history, though more must be done to prepare for the future. As stewards of the public trust, the Navy is obligated to spend money wisely. This is especially true today due to the strategic challenges posed by the ongoing War on Terrorism, by the need to recapitalize aging, Cold-War era infrastructure, and by the burgeoning technological changes that will inevitably alter the ways and means of war. Increasing the effectiveness of the Navy's output and execution is an important factor in transforming its warfighting capabilities.

"Sea Power 21" is the Navy's vision for delivering superior warfighting capabilities through new operational concepts, advanced technologies, innovative organizational initiatives, and improved acquisition processes. It provides the framework for accelerating innovative operational concepts and advanced technologies to the fleet; preparing warfighters with the right skills, in the right place, at the right time; and harvesting the efficiencies needed to invest in the future Navy—one of **vision, presence, and power**.

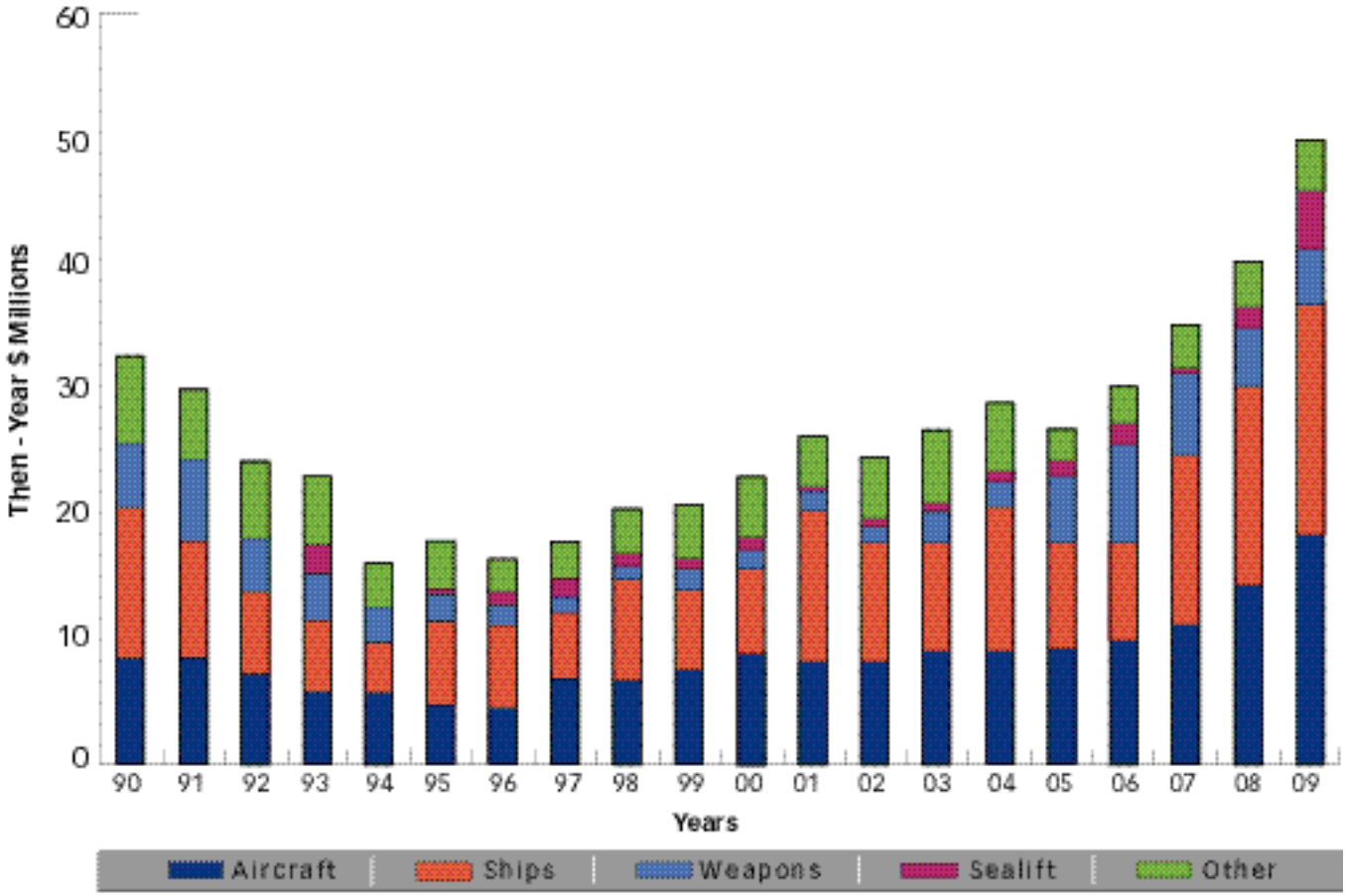


FIGURE 13 | Navy Procurement Trend, FY 1990-2009

Appendix A

Navy-Marine Corps Crisis Response and Combat Actions

Dates	Location/Operation/Mission	U.S. Naval Forces
Jan 1991	Somalia Operation Eastern Exit Non-combatant evacuation	USS Guam (LPH-9) Amphibious Ready Group USS Trenton (LPD-14) Amphibious Ready Group Marine Corps Force Recon, NSW/SEAL forces*
Nov 1991 - May 1993	Haiti/Guantanamo Bay Operation Able Manner/Safe Harbor Humanitarian Assistance to Haitian refugees	USS Tortuga (LSD-46) USMC 2nd Force Service Support Group Navy Seabees
Jan 1992 - Mar 2003	Iraq/Arabian Gulf Operation Northern Watch Operation Southern Watch Maritime Intercept Operations Continuing enforcement of no-fly zone in response to Iraqi provocations and support for UN sanctions	USS Carl Vinson (CVN-70) Battle Group USS Belleau Wood (LHA-3) Amphibious Ready Group USS Enterprise (CVN-65) Battle Group USS Roosevelt (CVN-71) Battle Group USS Constellation (CV-64) Battle Group USS Carl Vinson (CVN-70) Battle Group USS Kitty Hawk (CVN-63) Battle Group USS John F. Kennedy (CV-67) Battle Group USS Abraham Lincoln (CVN-72) Battle Group USS Shreveport (LPD-12) 31st MEU (SOC) Nuclear attack submarines Coast Guard law enforcement detachments Maritime patrol aircraft
Aug 1992 - Feb 1993	Kenya/Somalia Operation Provide Relief Humanitarian Assistance	11th Marine Expeditionary Unit (SOC)* USS Tarawa (LHA-1)
Dec 1992 - May 1993	Somalia Operation Restore Hope Humanitarian support	USS Ranger (CV-61) Battle Group USS Tripoli (LPH-10) Amphibious Ready Group 15th Marine Expeditionary Unit (SOC)* Military Sealift Command ships, Seabees*
July 1993 - Ongoing	Adriatic Sea/Balkans Operation Deny Flight Operation Sharp Guard Operation Provide Promise Operation Joint Guard Operation Deliberate Guard No-fly zone enforcement and Maritime Intercept Operations	Carrier Battle Groups/Surface Action Groups Amphibious Ready Groups Marine Expeditionary Units (SOC) Marine aircraft detachments (Aviano) Maritime patrol aircraft (Sigonella) Nuclear attack submarines Coast Guard law enforcement detachments
Jan 1993 - Mar 1994	Somalia Operation Sustain Hope Humanitarian support	Carrier Battle Groups Amphibious Ready Groups I MEF* elements Military Sealift Command ships
Jun 1993	Iraq/Red Sea TLAM missile strikes	USS Peterson (DD-969) USS Chancellorsville(CG-62) USS Theodore Roosevelt (CVN-71) Battle Group

Dates	Location/Operation/Mission	U.S. Naval Forces
Oct 1993	Somalia Humanitarian support	USS America (CV-66) Battle Group USS Guadalcanal (LPH-7) Amphibious Ready Group
Nov 1993 - Aug 1994	Haiti Operation Support Democracy UN blockade operations	Surface action groups/Amphibious Ready Groups NSW/SEAL forces Maritime patrol aircraft Coast Guard cutters,patrol boats
Apr - Aug 1994	Rwanda/Mombasa–relief effort/ Operation Distant Runner Operation Support Hope Non-combatant evacuation	USS Peleliu (LHA-5) Amphibious Ready Group 11th Marine Expeditionary Unit (SOC) USS Tripoli (LPH-10) Amphibious Ready Group 15th Marine Expeditionary Unit (SOC)
Apr 1994 - Ongoing	Caribbean,Eastern and South Pacific Support for JIATF East and West and JTF-6 Drug Interdiction	USS Rentz (FFG-46) USS Stump (DD-978) USS Crommelin (FFG-37) USS Estocin (FFG-15) USS McCampbell (DDG-85) USS Hayler (DD-997) USS John L. Hall (FFG-32) USS McInerney (FFG-8) USS McCluskey (FFG-41) USS Stephen W. Groves (FFG-29) USS Samuel B. Roberts (FFG-58) USS George Philip (FFG-12) USS Doyle (FFG-39)
Sep 1994	Haiti intervention Operation Restore Democracy	USS Dwight D. Eisenhower (CVN-69) USS America (CV-66) USS Wasp (LHD-1) Amphibious Ready Group Military Sealift Command ships Seabees*
Oct 1994	Iraq/Arabian Gulf/Red Sea Operation Vigilant Warrior Deterrence/support to Kuwait	USS George Washington (CVN-73) Battle Group USS Tripoli (LPH-10) Amphibious Ready Group 15th Marine Expeditionary Unit (SOC) Military Sealift Command ships
Oct 1994 - Mar 1995	Haiti Operation Uphold Democracy Nation-building	Military Sealift Command ships Patrol craft Seabees*
Feb - Mar 1995	Somalia Operation United Shield Withdrawal of UN Forces	USS Belleau Wood (LHA-3) Amphibious Ready Group USS Essex (LHD-2) Amphibious Ready Group I MEF elements
Jun 1995	Adriatic Sea/Bosnia Rescue of "Basher 52" Captain Scott O'Grady, USAF	USS Theodore Roosevelt (CVN-71) Battle Group USS Kearsarge (LHD-3) Amphibious Ready Group 24th Marine Expeditionary Unit (SOC) TRAP* Shore-based Navy/Marine Corps aircraft (Aviano)
Aug - Sep 1995	Adriatic Sea–Bosnia strikes Operation Deliberate Force	USS Theodore Roosevelt (CVN-71) Battle Group USS America (CV-66) Battle Group USS Kearsarge (LHD-3) Amphibious Ready Group Shore-based Navy/Marine Corps aircraft (Aviano)

Dates	Location/Operation/Mission	U.S. Naval Forces
Aug 1995	Iraq/Arabian Gulf Operation Vigilant Sentinel Deterrence/support to Kuwait	USS Abraham Lincoln (CVN-72) Battle Group USS New Orleans (LPH-11) Amphibious Ready Group I MEF elements
Nov 1995 - Dec 1996	Adriatic/Balkans Operation Joint Endeavor Dayton peace accord enforcement	Carrier Battle Groups/Amphibious Ready Groups Military Sealift Command ships Nuclear attack submarines Shore-based Navy/Marine Corps aircraft (Aviano)
Mar 1996	China/Taiwan–Freedom of Navigation, Regional Stability	USS Independence (CV-62) Battle Group USS Nimitz (CVN-68) Battle Group
Apr - Aug 1996	Liberia/ Central African Republic Non-combatant evacuation	USS Guam (LPH-5) ARG 22nd MEU (SOC) USS Ponce (LPD-15) Special Purpose Marine Air Ground Task Force
Sep1996	Iraq Operation Desert Strike Suppression of Air Defenses	USS Carl Vinson (CVN-70) Battle Group Surface warships Nuclear attack submarines
Mar - Jun1997	Adriatic/Adriatic Operation Silver Wake Non-combatant evacuation Embassy security	USS Nassau (LHA-4) Amphibious Ready Group Surface warships,and other amphibious ships 26th MEU (SOC) and other FMF LANT elements
Apr - May 1997	Iran/Iraq/Arabian Gulf Deterrence/support of UN disarmament inspections	Middle East Task Force USS Nimitz (CVN-68) Battle Group USS George Washington (CVN-73) Battle Group USS Independence (CV-62) Battle Group USS Peleliu (LHA-5) Amphibious Ready Group 13th MEU (SOC) USS Guam (LPH-9) 24th MEU (SOC) Coast Guard Cutters
Nov 1997	Doha,Qatar Operation Silent Assurance Enhance security for U.S.citizens and facilities during Middle East/ North Africa Conference	13th MEU (SOC)
Feb1998	Iraq/Arabian Gulf Deterrence/support of UN disarmament inspections	USS George Washington (CVN-73) Battle Group USS Independence (CV-62) Battle Group USS Guam (LPH-9) Amphibious Ready Group
Jun 1998	Adriatic Sea/Albania/Macedonia Exercise Determined Falcon NATO demonstration exercise to support Kosovo cease fire	USS Wasp (LHD-1) Amphibious Ready Group 26th MEU (SOC) aviation elements
Aug 1998	Nairobi, Kenya and Dar Es Salaam, Tanzania, response to terrorist bombings of U.S. embassies	Marine Corps Fleet Anti-terrorist Security Team (FAST) platoons Navy Seabees

Dates	Location/Operation/Mission	U.S. Naval Forces
Aug 1998	Khartoum, Sudan/Red Sea and Afghanistan/Indian Ocean Anti-terrorist strikes	Unspecified U.S. naval vessels
Nov 1998	Honduras/Central America Joint Task Forces Bravo and Aguila Disaster relief following Hurricane Mitch	I MEF assets Seabees*
Dec 16 - 22, 1998	Iraq Operation Desert Fox Strikes against Iraqi sites suspected of WMD production	USS Enterprise (CVN-65) Carrier Battle Group USS Carl Vinson (CVN-70) Carrier Battle Group USS Belleau Wood (LHA-3) 31st MEF USS Ardent (MCM-12) USS Dextrous (MCM-13)
Mar - Jun 1999	Kosovo/Former Republic of Yugoslavia Operation Allied Force Ensure Yugoslav withdrawal from Kosovo, safe return of displaced people	USS Enterprise (CVN-65) Battle Group USS Theodore Roosevelt (CVN-71) Battle Group USS Kearsarge (LHD-3) Amphibious Ready Group 26th MEU
Apr - Aug 1999	Albania Operation Shining Hope Humanitarian relief to refugees from Former Republic of Yugoslavia	USS Inchon (MCS-12) Task Group Navy Seabees
Jun 1999 - Ongoing	Kosovo/Federal Republic of Yugoslavia Operation Joint Guardian Peace-keeping mission to establish and maintain a secure environment in Kosovo, ensure demilitarization treaty compliance	USS Kearsarge (LHD-3) Amphibious Ready Group 26th MEU 24th MEU VP-8
Aug 1999	Turkey/Sea of Marmara Operation Avid Response Provide humanitarian relief to earthquake victims	USS Kearsarge (LHD-3) Amphibious Ready Group
Sep - Nov 1999	East Timor/Philippine Sea Operation Stabilize Peacekeeping mission/provided communication and logistical support	USS Mobile Bay (CG-53) USNS Kilauea (T-AE26) USS Belleau Wood (LHA-3) USS Peleliu (LHA-5) 11th MEU 31st MEU
Sep1999	Atlantic Coast Assistance to victims of Hurricane Floyd	USS John F. Kennedy (CV-67)
Oct 1999	Atlantic Coast Search and Recovery Mission for EgyptAir Flight 990	USS Grapple (ARS-53) USS Austin (LPD-4) USS Oriole (MHC-55) USNS Mohawk (T-ATF-170) MH-14 Det 2

Dates	Location/Operation/Mission	U.S. Naval Forces
Jan - Mar 2000	Venezuela Search and rescue and humanitarian assistance after intense storms	II MEF detachment
Feb 2000	California Coast Search and Recovery Mission for Alaska Air Flight 261	USS Fife (DD-991) USS Jarrett (FFG-33) USS Cleveland (LPD-7) M/V Kellie Chouest MSC units Maritime patrol aircraft EODGRU One UCT-2 MDSU SDGO
Feb 2000 - May 2002	East Timor Support of US Support Group East Timor (USGET) and UN Transition Administration - East Timor (UNTAET) Humanitarian Assistance	Medical Support Teams Amphibious Ready Groups Marine Expeditionary Units Helicopter Support Squadron 5 Detachment 1
Jul 2000	Wildfires in U.S. West Assistance to firefighters	3d Battalion,11th Marines,I MEF
Aug 2000	Bahrain Gulf Air Airbus 320 Crash earch and Recovery Mission	USNS Catawba (T-ATF 168) USS Oldendorf (DD-972 USS George Washington (CVN-73) HCSS 2, Det 2
Oct 2000	Yemen Operation Determined Response Support of USS Cole damaged in terrorist attack	USS Tarawa (LHA-1) USS Donald Cook (DDG-75) USS Hawes (FFG-53) USS Duluth (LPD-6) USS Anchorage (LSD-36) USNS Catawba (T-ATF-168) 13th MEU (SOC) Platoons from 1st and 2nd FASTs*
Feb 2001	India Disaster relief to earthquake victims	USS Cowpens (CG-63)
Aug 2001	Wildfires in U.S. West Assistance to firefighters	II MEF personnel
Aug - Nov 2001	Hawaii Recovery of Japanese fishing/ training vessel Ehime Maru	Mobile Diving and Salvage Unit 1 Remotely Operated Vehicles
Sep 2001 - Ongoing	Operation Noble Eagle Response to terrorist attacks on World Trade Center and Pentagon Homeland Defense	USNS Comfort (T-AH 20) USNS Denebola (T-AKR 289) USS John F. Kennedy (CV-67) CVBG USS George Washington (CVN-73) CVBG USCG USS John C.Stennis (CVN-74) CVBG 6 Cyclone-class PCs Aegis cruisers and destroyers

Dates	Location/Operation/Mission	U.S. Naval Forces
Oct 2001 - Ongoing	Afghanistan Operation Enduring Freedom Strike and combat operations against terrorist forces Coastal patrol and maritime homeland security	USS Enterprise (CVN-65) Battle GroupOperation USS Carl Vinson (CVN-70) Battle Group USS Theodore Roosevelt (CVN-71) Battle Group USS Kitty Hawk (CV-66) Battle Group USS John C.Stennis (CVN-74) Battle Group USS John F. Kennedy (CV-67) Battle Group USS Peleliu (LHA-5) ARG USS Bataan (LHD-5) ARG USS Bonhomme Richard (LHD-6) ARG USS Constellation (CV-64) Battle Group USS Abraham Lincoln (CVN-72) Battle Group USS Harry S. Truman (CVN-75) Battle Group USS Mount Whitney (LCC-20) USS George Washington (CVN-78) Battle Group USS Nassau (LHA-4) ARG USS Essex (LHD-2) ARG USS O'Kane (DDG-77) USS Mount Whitney (LCC-20)
Oct 2001 - Ongoing	Mediterranean Operation Active Endeavour NATO response to 9/11 Monitoring Shipping / Intelligence Exchange	USS Elrod (FFG -55) USS Hawes (FFG-53) Elements of 6th Fleet
Jan - Apr 2002	Strait of Malacca Ship protection	USS Ford (FFG-54) USS Cowpens (CG-63)
Feb - May 2002	El Salvador	NMCB-7
Feb - Jul 2002	Philippines Joint Task Force 510 Training and support in pursuit of terrorists. Transitioned to Joint Special Ops Task Force - Philippines Conducts humanitarian/ civic action programs	USS Germantown (LSD-42) III MEF Naval Construction Task Group
Mar 2002	Eastern Afghanistan Operation Anaconda Ground operation against Al Qaida, Taliban strongholds	Navy SEALs Marine Helicopters
Jun 2002	Rescue of merchant ship crew off coast of Oman	USS Vicksburg (CG-69)
Dec 2002	Assistance to Guam following Super Typhoon Pongsona	Naval Military Construction Battalion 74 USS Frank Cable (AS-40)
Dec 2002 - Ongoing	Horn of Africa/Djibouti Joint Task Force Horn of Africa Detect,disrupt, defeat transnational terrorist groups	USS Mount Whitney (LCC-20) 24th MEU (SOC) USS Iwo Jima (LHD-7) ARG USS Peleliu (LHA-5) ESG USS Belleau Wood (LHA-3) ARG USS Nassau (LHA-4) ARG

Dates	Location/Operation/Mission	U.S. Naval Forces
Feb - Mar 2003	Texas Shuttle Columbia Disaster Recovery	Navy Mobile Diving and Salvage Team 2 Mobile Diving and Salvage Unit 2, Det.409
Mar 2003 - Ongoing	Persian Gulf, Mediterranean Sea Operation Iraqi Freedom	USS Enterprise (CVN-65) Carrier Strike Group USS Theodore Roosevelt (CVN-71)Carrier Strike Group USS Harry S. Truman (CVN-75) Carrier Strike Group USS Nimitz (CVN-68) Carrier Strike Group USS Constellation (CV-64) Carrier Strike Group USS Kitty Hawk (CV-63) Carrier Strike Group USS Abraham Lincoln (CVN-72) Carrier Strike Group USS Tarawa (LHA-1) Expeditionary Strike Group USS Iwo Jima (LHD-7) Expeditionary Strike Group USS Nassau (LHA-4) Expeditionary Strike Group USS Bataan (LHD-5) USS Bonhomme Richard (LHD-6) USS Boxer (LHD-4) USS Kearsarge (LHD-3) USS Saipan (LHD-2) USS Carter Hall (LSD-50) USS Anchorage (LSD-36) USS Ashland (LSD-48) USS Comstock (LSD-45) USS Pearl Harbor (LSD-52) USS Rushmore (LSD-47) USS Tortuga (LSD-46) USS Gunston Hall (LSD-44) USS Higgins (DDG-76) (w/Task Force 150) USS Fletcher (DD-992) (w/ Task Force 150) USS Rodney Davis (FFG-60) (w/Task Force 150) USNS Comfort (T-AH-20) 8 Mine Sweeper Ships 2 PC-class ships Nuclear Attack Submarines EA-6B Expeditionary Aircraft Squadrons P-3C Maritime Patrol Aircraft Squadrons EP-3 Surveillance Aircraft Squadrons Navy Unique Fleet Essential Airlift aircraft Cargo Handling Battalions Naval Coastal Warfare (NCW) units Naval Mobile Construction Battalions (NMCB) Navy Special Warfare (NSW) units Navy Medical Forces 1st Marine Expeditionary Force (MEF) 2nd Marine Expeditionary Brigade (MEB) 15th Marine Expeditionary Unit (MEU) USS Mount Whitney (LCC-20)
Jul 2003	Liberia Security of American, Allied Citizens	Fleet Anti-Terrorism Security Team (FAST)

**NSW–Naval Special Warfare; SEAL–Sea Air Land Teams; MEU–Marine Expeditionary Unit; MEF–Marine Expeditionary Force; SOC–Special Operations Capable; TRAP–Tactical Recovery of Aircraft and Personnel; Seabees–Naval Construction Battalions; FAST–Fleet Antiterrorism Support Team*

Appendix B
Glossary

AADC	Area Air Defense Commander
AARGM	Advanced Anti-Radiation Guided Missile
AAW	Anti-Air Warfare
ABNCP	Airborne Command Post
ACAT	Acquisition Category
ACAT IAM	Major automated information system acquisition category
ACCES	Advanced Cryptologic Carry-on Exploitation System
ACDS	Advanced Combat Direction System
ACS	Aerial Common Sensor
ACTD	Advanced Concept Technology Demonstration
AD	Air Defense
ADCAP	Advanced Capability
ADM	Acquisition Decision Memorandum
ADNS	Automated Digital Network System
ADP	Automated Data Processing
ADS	Advanced Deployable System
AE	Assault Echelons
AEA	Airborne Electronic Attack
AEHF	Advanced Extremely High Frequency
AEM/S	Advanced Enclosed Mast/Sensor
AoA	Analysis of Alternatives
AESA	Active Electronically Scanned Array
AFATDS	Advanced Field Artillery Tactical Data System
AFG	Airfoil Group
AFFF	Aqueous Film Forming Foam
AFOE	Assault Follow-On Echelon
AFQT	Armed Forces Qualification Test
AG	Aerographer's Mate (enlisted classification)
AGF/LCC	Amphibious Command Ship
AGS	Advanced Gun System
AIEWS	Advanced Integrated Electronic Warfare System
AIP	Anti—Submarine Warfare Improvement Program
ALCS	Airborne Launch Control System
AHE	Advanced Hawkeye
ALMDS	Airborne Laser Mine Detection System
AMCM	Airborne Mine Countermeasures
AMF	Airborne Maritime Fixed
AMNS	Airborne Mine Neutralization System
AMPIR	Airborne Polarmetric Microwave Imaging Radiometer
AMRAAM	Advanced Medium Range Air-to-Air Missile
ANDVT	Advanced Narrow-Band Digital Voice Terminal
AOA	Analysis of Alternatives,also, Amphibious Objective Area
AOE	Fast Combat Support Ship
AOR	Area of Responsibility
APB	Advanced Processor Build, or, Acquisition Program Baseline
APMIR	Airborne Polarmetric Microwave Imaging Radiometer
APS	Air Force Prepositioning Ships
APTS	Afloat Personal Telephone Service
ARCI	Acoustic Rapid COTS Insertion
ARG	Amphibious Ready Group
ARI	Active Reserve Integration
ARM	Anti-Radiation Missile
AS	Submarine Tender, or, Acquisition Strategy
ASDS	Advanced Seal Delivery System
ASCM	Anti-Ship Cruise Missile
ASUW	Anti-Surface Warfare
ASW	Anti-Submarine Warfare
ASWC	Anti-Submarine Warfare Commander
AT	Advanced Targeting
ATC	Air Traffic Control
ATD	Advanced Technology Demonstration, or, Aircrew Training Device
ATDLS	Advanced Tactical Data LinkSystem
AT- FLIR	Advanced Targeting Forward-Looking Infrared
ATM	Asynchronous Transfer Mode
ATWCS	Advanced Tomahawk Weapon Control
AWACS	Airborne Warning and Control System
AWS	Advanced Wideband System
BAH	Basic Allowance for Housing
BAMS	Broad Area Maritime Surveillance
BDI	Battle Damage Indication
BDII	Battle Damage Indication Imagery
BFCAPP	Battle Force Capability Assessment and Programming Process
BLII	Base-Level Information Infrastructure
BLOS	Basic Line of Sight
BMC4I	Battle Management/ Command, Control, Communications, Computers, and Intelligence
BMD	Ballistic Missile Defense
BMDS	Ballistic Missile Defense System
BMUP	Block Modification Upgrade Program
BPI	Business Process Improvement
BRAC	Base Realignment and ClosureC2P Command and Control Processor
C2{(R)	Command and Control Processor (Re-Host)
C3	Command, Control,and Communications
C3I	Command, Control, Communications,and Intelligence
C4ISR	Command, Control, Communication, Computers, Intelligence, Surveillance, and Reconnaissance
C4N	Command, Control, Communications, Computers,and Navigation
C5F	Commander, Fifth Fleet
CAC	Common-Access Cards

CAD	Component Advanced Development
CADRT	Computer-Aided Dead-Reckoning Table
CAL/VAL	Calibration and Validation
CAS	Close Air Support
CB	Chemical, Biological
CBASS	Common Broadband Advanced Sonar System
CBR	Chemical, Biological,and Radiological
CBRND	Chemical, Biological, Radiological, Nuclear Defense
CCD	Center for Career Development
CCG	Computer Control Group
CCP	Common Configuration Program
CCS	Combat Control System
CDA	Commercially-Derived Aircraft
CDD	Capabilities Development Document
CDHQ	Central Command Deployable Headquarters
CDL-N	Common Data Link, Navy
CDLMS	Common Data Link Management System
CDLS	Common Data Link System
CDR	Critical Design Review
CDS	Combat Direction System
CEB	CNO Executive Board
CEC	Cooperative Engagement Capability
CFFC	Commander, Fleet Forces Command
CG	Guided Missile Cruiser
CG(X)	Next Generation Cruiser
CIE	Collaborative Information Environment
CIO	Chief Information Officer
CIWS	Close-In Weapon System
CJF	Commander, Joint Forces
CLF	Combat Logistics Force
CLIP	Common Link Integration Processing
CM	Cryptographic Modernization
CND	Computer Network Defense
CNI	Commander, Naval Installations Command
CNO	Chief of Naval Operations
CNRC	Commander, Naval Recruiting Command
CNS	Communication/Navigation System
CNVA	Computer Network Vulnerability Assessment
COE	Common Operating Environment
COLDS	Cargo Offload and Discharge System
COMINT	Communications Intelligence
COMSEC	Communications Security
COMSUBGRU	Commander, Submarine Group
CONOPS	Concept of Operations
CONUS	Continental United States
COP	Common Operational Picture
COS	Class of Service
COTS	Commercial-Off-The-Shelf, also Cargo Offload and Transfer System
CPD	Capabilities Production Document
CSAR	Combat Search and Rescue
CSDTS	Common Shipboard Data Terminal Set
CSG	Carrier Strike Group
CSIT	Combat System Integration and Test
CSRB	Critical Skills Retention Bonus
CSRR	Common Submarine Radio Room
CSWP	Commercial Satellite Wideband Program
CTAPS	Contingency Tactical Automated Planning System (for TACS)
CTF	Component Task Force, or, Commander Task Force
CTOL	Conventional Takeoff and Landing
CTP	Common Tactical Picture
CUP	Common Undersea Program
CV	Conventionally Powered Aircraft Carrier, or, Carrier Variant aircraft
CVBG	Aircraft Carrier Battle Group
CVIC	Carrier Intelligence Center
CVN	Nuclear-Powered Aircraft Carrier
CVNX	Next-Generation Nuclear-Powered Aircraft Carrier
D5E	Destruction, degradation, denial,disruption, deceit,and Exploitation
DAB	Defense Acquisition Board
DARPA	Defense Advanced Research Projects Agency
DBRS	Dual-Band Radar Suite
DCA	Defensive Counter-Air
DCGS	Distributed Common Ground System
DCID	Director, Central Intelligence Directive
DCMS	Director, Communications Security Material Systems
DCNO	Deputy Chief of Naval Operations
DD	Destroyer
DD-21	21st Land-Attack Destroyer
DD(X)	Next Generation Destroyer
DEM/VAL	Demonstration/Validation
DF	Direction Finding
DDG	Guided Missile Destroyer
DIB	DCGS Integration Backbone
DIF	Database Integration Framework
DII COE	Defense Information Infrastructure Common Operating Environment
DIMHRS	Defense Integrated Military Human Resource System
DIMUS	Digital Multi-beam Steering
DIO	Defensive Information Operations
DISA	Defense Information Systems Agency
DISN	Defense Information Systems Network
DJC2	Deployable Joint Command and Control (program)
DLS	Decoy Launching System
DMR	Digital Modular Radio
DMS	Defense Message System
DMSP	Defense Meteorology Satellite Program
DNM	Dynamic Network Management
DNS	Director, Navy Staff
DiD	Defense-in-Depth
DoD	Department of Defense
DoN	Department of the Navy

DOTMLPF	Doctrine,Organization, Training, Materiel, Leadership, Personnel,and Facilities
DPRIS/EMPRS	Defense Personnel Record Imaging System/ Electronic Military Personnel Record System
DSCS	Defense Satellite Communications System
DRPM	Direct-Reporting Program Manager
DSMAC	Digital Scene-Matching Area Correlation
DSN	Defense Switching Network
DSRV	Deep-Submergence Rescue Vehicle
DT	Developmental Testing
DTH	DMS Transitional Hubs
EA	Electronic Attack
EAM	Emergency Action Message
EB	Electric Boat
ECM	Electronic Countermeasures
ECCM	Electronic Counter-Countermeasures
ECP	Engineering Change Proposal
ECS	Exterior Communication System
EDS	Electronic Data Systems
EFV	Expeditionary Fighting Vehicle
EHF	Extremely High Frequency
EIS	Environmental Impact Statement
EKMS	Electronic Key Management System
ELINT	Electronic Intelligence
ELC	Enhanced Lethality Cartridge
EMD	Engineering and Manufacturing Development
EMW	Expeditionary Maneuver Warfare
EOC	Early Operational Capability
EOD	Explosive Ordnance Disposal
EOID	Electro-Optic Identification
ER	Extended Range
ERAM	Extended Range Active Missile
ERGM	Extended-Range Guided Munition
ERM	Extended Range Munition
ERNT	CNO Executive Review of Navy Training
ESG	Expeditionary Strike Group
ESM	Electronic Support Measures
ESSI	Enhanced Special Structural Inspection
ESSM	Evolved Sea Sparrow Missile
ETC	Echo Tracker Classifier
EURCENT	European Central (NCTAMS)
EW	Electronic Warfare
EXCEL	Excellence through Commitment to Education and Learning
FBE	Fleet Battle Experiment
FBM	Fleet Ballistic Missile
FDS	Fixed Distributed System
FDS-C	FDS - COTS
FFG	Guided Missile Frigate
FFSP	Fleet and Family Support Program
FHLT	Fleet High-Level Terminal
FIE	Fly-In Echelon
FITC	Fleet Intelligence Training Center
FLIR	Forward-Looking Infrared
FLTSAT	Fleet Satellite
FOC	Full Operational Capability
FORCENet	Navy web of secure communications and information links
FOT	Follow-On Terminal
FOT&E	Full Operational Test and Evaluation
FP	Full Production
FRP	Full-Rate Production, or, Fleet Response Plan
FTS	Full-Time Support
FUE	First Unit Equipped
FY	Fiscal Year
FYDP	Future Years Defense Plan
GBS	Global Broadcast Service
GBTS	Ground-Based Training System
GCCS	Global Command and Control System
GCS	Ground Control Station
GCSS	Global Command Support System
GDAIS	General Dynamics Advanced Information Systems
GDIS	General Dynamics Information Systems
GENDET	General Detail (personnel)
GENSER	General Service
GFE	Government-Furnished Equipment
GHMD	Global Hawk Maritime Demonstration system
GIG	Global Information Grid
GIG-BE	Global Information Grid -Bandwidth Expansion
GMF	Ground Mobile Force (Air Force)
GOTS	Government-Off-The-Shelf
GPS	Global Positioning System
GT	Gas Turbine
HARM	High-Speed Anti-Radiation Missile
HD/LD	High-Demand/Low-Density
HDR	High Data-Rate
HF	High Frequency
HLCAC	Heavy Lift Landing Craft, Air Cushion
HM&E	Human, Mechanical,and Electrical (systems)
HMI	Human-Machine Interface
HMMWV	High-Mobility Multi-purpose Wheeled Vehicle
HOLC	High Order Language Computer
HPC	Human Performance Center
HSDG	High School Diploma Graduate
IA	Information Assurance
IATF	IA Technical Framework
IBS	Integrated Broadcast Service
I&W	Indications & Warning
IBS/JTT	Integrated Broadcast Service/ Joint Tactical Terminal
ICAA	Investment Capability Analysis and Assessment
ICAO	International Civil Aviation Organization
ICAP	Improved Capability
ICD	Initial Capabilities Document
ICSTF	Integrated Combat Systems Test Facility
IDSN	Integrated Digital Switching Network
IDTC	Inter-Deployment Training Cycle
IETM	Interactive Electronic Technical Manual
IFF	Identification, Friend or Foe

IMINT	Imagery Intelligence
INLS	Improved Navy Lighterage
INS	Inertial Navigation System
IO	Information Operations
IOC	Initial Operational Capability Development
IP	Internet Protocol
IPDS	Improved Point Detector System
IPPD	Integrated Product and Process Development
IPS	Integrated Power System
IPT	Integrated Process Team
IPR	Interim Program Review
IR	Infrared
IS	Information Systems
ISR	Intelligence, Surveillance, Reconnaissance
IRST	Infrared Search and Track
ISDN	Integrated Services Digital Network
ISNS	Integrated Shipboard Network System
ISO	Investment Strategy Options
ISPP	Integrated Sponsor's Program Proposal
ISS	Information Superiority/Sensors
ISSP	Information Systems Security Program
ISR	Intelligence Surveillance,and Reconnaissance
ISRT	Intelligence, Surveillance, Reconnaissance,and Targeting
IT	Information Technology
IT-21	Information Technology for the 21st Century
ITAB	Information Technology Acquisition Board
IU	Interface Unit
IUSS	Integrated Undersea Surveillance System
IW	Indications and Warning
IWS	Integrated Warfare Systems
J&A	Justification and Approval
JASA	Joint Airborne SIGINT Architecture
JASSM	Joint Air-to-Surface Standoff Missile
JCIDS	Joint Capabilities Integration and Development System
JCM	Joint Common Missile
JCS	Joint Chiefs of Staff
JC2-MA	Joint Command and Control - Maritime Applications
JDAM	Joint Direct Attack Munition
JDISS	Joint Deployable Intelligence Support Service
JDN	Joint Data Network
JFC	Joint Force Commander
JFCOM	Joint Forces Command
JFMCC	Joint Forces Maritime Component Commander
JHMCS	Joint Helmet Mounted Cueing System
JFN	Joint Fires Network
JFNU	Joint Fires Network Unit
JIC	Joint Intelligence Center
JICO/JSS	Joint Interface Control Officer Support System
JMCIS	Joint Maritime Command Information System
JHDA	Joint Host Demand Algorithm
JMAST	Joint Mobile Ashore Support Terminal
JMCOMS	Joint Maritime Communications Strategy
JMLS	Joint Modular Lighterage System
JMOD	Joint Airborne SIGINT Architecture Modification
JMPS	Joint Mission Planning System
JNIC	Joint National Integration Center
JNMS	Joint Network Management System
JOA	Joint Operations Area
JOTBS	Joint Operational Test Bed System
JPACE	Joint Protective Aircrew Ensemble
JPATS	Joint Primary Aircraft Training System
JROC	Joint Requirements Oversight Council
JSF	Joint Strike Fighter
JSIPS	Joint Service Imagery Processing System
JSMO	Joint Systems Management Office
JSOW	Joint Standoff Weapon
JSPO	Joint System Program Office
JTA	Joint Tactical Architecture
JTAMDO	Joint Theater Air and Missile Defense Organization
JTDLMP	Joint Tactical Data Link Management Plan
JTIDS	Joint Tactical Information Distribution System
JWICS	Joint Worldwide Intelligence Communications System
JTRS	Joint Tactical Radio System
JTT	Joint Tactical Terminal
J-UCAS	Joint Unmanned Combat Air System
KDP	Key Decision Point
KPP	Key Performance Parameter
LAMPS	Light Airborne Multipurpose System
LAN	Local Area Network
LANT	Atlantic
LANTIRN	Low-Altitude Navigation and Targeting Infrared At Night
LCAC	Landing Craft, Air Cushion
LCB	Lateral Conversion Bonus
LCC	Amphibious Command Ship
LCGR	Launch Control Group Replacement
LCS	Littoral Combat Ship
LCU(R)	Landing Craft Utility ship (replacement)
LD/HD	Low-Density/High Demand
LDR	Low Data Rate
LDUUV	Large-Diameter Unmanned Undersea Vehicle
LEAD	Launched Expendable Acoustic Decoy
LEAP	Lightweight Exo-Atmospheric Projectile
LEASAT	Leased Satellite
LFA	Low Frequency Active
LHA-R	Amphibious Assault Ship-Replacement
LGB	Laser-Guided Bomb
LHD	Amphibious Assault Ship
LHT	Lightweight Hybrid Torpedo
LIDAR	Light Detection and Ranging
LMRS	Long-Term Mine Reconnaissance System
LMS	Local Monitor Station
LOS	Line of Sight, or, Length of Service
LOTS	Logistics-Over-The-Shore

LPD	Amphibious Transport Dock [Ship]
LPI	Low-Probability-of-Intercept
LPMP	Launch Platform Mission Planning
LRIP	Low Rate Initial Production
LRLAP	Long-Range Land-Attack Projectile
LSD	Dock Landing Ship
LSS	Littoral Surveillance System
LST	Task Landing Ship
LVT	Low-Volume Terminal
MA	Maritime Applications
MAGTF	Marine Air-Ground Task Force
MARCEMP	Manual Relay Center Modernization Program
MAST	Mobile Ashore Support Terminal
MATT	Multi-mission Airborne Tactical Terminal
MAWS	Missile Approach Warning System
M/BVR	Medium/Beyond Visual Range missile
MCEN	Marine Corps Enterprise Network
MCM	Mine Countermeasures
MCAS	Marine Corps Air Station
MCM	Mine Countermeasures
MCP	Mission Capability Package
MCPON	Master Chief Petty Officer of the Navy
MCS	Mine Countermeasures Command, Control,and Support Ship, or, Mission Computer System
MCS-21	Maritime Cryptologic System for the 21st Century
MCU	Mission Computer Upgrade
MDA	Missile Defense Agency
MDR	Medium Data Rate
MDS	Multi-function Display System
MEB	Marine Expeditionary Brigade
MEF	Marine Expeditionary Force
METOC	Meteorological and Oceanographic Sensors
MEU	Marine Expeditionary Unit
MEU(SOC)	Marine Expeditionary Unit (Special Operations Capable)
MF/HF/ VHF/UHF	Medium/High/very High/ Ultra High Frequency
MFL	Multi-Frequency Link
MFR	Multi-Function Radar
MFTA	Multi-Function Towed Array
MHC	Coastal Mine Hunter
MHIP	Missile Homing Improvement Program
MICFAC	Mobile Integrated Command Facility
MID	Management Initiative Decision
MIDS	Multi-Function Information Distribution System
MIDS-LVT	Multi-Function Information Distribution System-Low -Volume Terminal
MILSTAR	Military Strategic and Tactical Relay satellite
MIRV	Multiple Independently Targeted Reentry Vehicle
MIUW	Mobile Inshore Undersea Warfare
MIW	Mine Warfare
MIWC	Mine Warfare Commander
MLS	Multi-Level Security
MMA	Multi-mission Maritime Aircraft
MMRT	Modified Miniature Receiver Terminal
MNS	Mission Need Statement, also Mine Neutralization System
MOA	Memorandum of Agreement
MOCC	Mobile Operational Command Control Center
MOD	Modification
MOU	Memorandum of Understanding
MPA	Maritime Patrol Aircraft
MPF(F)	Maritime Prepositioning Force(Future)
MPG	Maritime Prepositioning Group
MPS	Maritime Prepositioning Ship, or, Mission Planning System
MRMS	Maintenance Resource Management System
MRUUV	Mission-Reconfigurable Unmanned Undersea Vehicle
MS	Mess Management Specialist (enlisted classification)
MSC	Military Sealift Command
MTI	Moving Target Indicator
MUOS	Mobile User Objective System
MWR	Morale, Welfare,and Recreation
NADEP	Naval Aviation Depot
NAF	Naval Air Facility
NALCOMIS	Naval Aviation Logistics Command Management Information System
NAS	Naval Air Station
NASA	National Aeronautics and Space Administration
NATOPS	Naval Aviation and Training Operating Procedures Standardization
NAVAIRSYSCOM	Naval Air Systems Command
NAVCENT	U.S. Naval Forces, Central Commmand
NAVFLIR	Navigation, Forward-Looking Infrared [sensor]
NavMPS	Naval Mission Planning System
NAVSSI	Navigation Sensor System Interface
NAVSEA	Naval Sea Systems Command
NAVSECGRU	Naval Security Group
NAVSUP	Naval Supply Systems Command
NAVWAR	Navigation Warfare
NCDP	Naval Capabilities Development Process
NCES	Net-Centric Enterprise Services
NCFS	Naval Fires Control System
NCO	Network-Centric Operations
NCP	Naval Capability Pillar, or, Naval Capability Plan
NCTAMS	Naval Computer and Telecommunications Area Master Stations
NCTF	Naval Component Task Force
NCTS	Naval Computer and Telecommunications Station
NCUSW	Net Centric Undersea Warfare
NCW	Network-Centric Warfare, or, Navy Coastal Warfare
NDI	Non-Developmental Item
NEC	Naval Enlistment Classification
NEO	Non-Combatant Evacuation
NEP	Navy Enterprise Portal

NESP	Navy Extremely High Frequency (EHF) Satellite Program
NETC	Naval Education and Training Command
NETWARCOM	Network Warfare Command
NFCS	Naval Fires Control System
NFN	Naval Fires Network,and/or Joint Fires Network
NFO	Naval Flight Officer
NFS	Naval Fire Support
NGC2P	Next Generation Command and Control Processor
NGNN	Northrup Grumman Newport News
NGO	Non-Governmental Organization
NGSS	Northrup Grumman Ship Systems
NIFC-CA	Navy Integrated Fire Control - Counter Air
NII	Network Information Integration
NILE	NATO Improved Link Eleven
NIMA	National Imagery and Mapping Agency
NIPRNET	Unclassified-but-Sensitive Internet Protocol Router Network
NITF	National Imagery Transportation Format
N/JCA	Navy/Joint Concentrator Architecture
NMCB	Naval Mobile Constuction Battalion
NMCI	Navy Marine Corps Intranet
NMCP	Navy Marine Corps Portal
NMITC	Navy Maritime Intelligence Training Center
NMT	Navy Advanced Extremely High Frequency Multiband Terminal
NOAA	National Oceanographic and Atmospheric Administration
NOC	Network Operation Center
NPDC	Naval Personnel Development Command
NPOESS	National Polar-Orbiting Operational Environmental Satellite System
NRF	Naval Reserve Force
NRL	Naval Research Laboratory
NROC	Navy Requirements Oversight Council
NRTD	Near Real-Time Dissemination
NSA	National Security Agency
NSAWC	Naval Strike Air Warfare Center
NSCT	Naval Special Clearance Team
NSFS	Naval Surface Fire Support
NSIPS	Navy Standard Integrated Personnel System
NSPG	Navy Strategic Planning Guidance
NSSMS	NATO Sea Sparrow Missile System
NSSN	New Attack Submarine (Virginia SSN-774 Class)
NSTC	Naval Service Training Command
NSW	Naval Special Warfare
NSWC/DD	Naval Surface Warfare Center/ Dahlgren Division
NSWC/PH	Naval Surface Warfare Center/Port Hueneme
NTCS-A	Naval Tactical Command System - Afloat
NTCSS	Naval Tactical Command Support System
NTDS	Naval Tactical Data System
NUFEA-RA	Navy Unique Fleet Essential Airlift-Replacement Aircraft
NUWC	Naval Underwater Warfare Center
NWDC	Navy Warfare Development Command
OAG	Operational Advisory Group
OAS	Offensive Air Support (USMC)
OASD	Office of the Assistant Secretary of Defense
OASIS	Organic Airborne and Surface Influence Sweep
OBT	On-Board Trainer
OCA	Offensive Counter-Air
OED	OSIS Evolutionary Development
OEF	Operation Enduring Freedom
OEO	Other Expeditionary Operations
OGB	Optimized Gun Barrel
OIF	Operation Iraqi Freedom
OMFTS	Operational Maneuver From The Sea
ONR	Office of Naval Research
OPAREA	Operational exercise area
OPEVAL	Operational Evaluation
OPNAV	Office of the Chief of Naval Operations
OPTEMPO	Operating Tempo
OPTEVFOR	Operational Test and Evaluation Force
OR	Operational Requirement
ORD	Operational Requirements Document
OSA	Open System Architecture
OSCAR	Open Systems-Core Avionics Requirements
OSD	Office of the Secretary of Defense
OSIS	Ocean Surveillance Information System
OSS	Operational Support System
OT	Operational Testing
OT&E	Operational Testing and Evaluation
P3I	Pre-Planned Product Improvement
PAC	Pacific
PACE	Program for Afloat College Education
PAS	Processing and Analysis Segment
PEO	Program Executive Office (and Officer)
PERSTEMPO	Personnel Tempo
PDM	Program Decision Memorandum
PDR	Preliminary Design Review
PFPS	Portable Flight-Planning Software
PGM	Precision-Guided Munition
PIP	Product Improvement Program, or, Pioneer (UAV) Improvement Program
PKI	Public Key Infrastructure
POM	Program Objective Memorandum
POR	Program of Record
PPBE	Planning, Programming, Budgeting, and Execution process
PPBS	Planning, Programming, and Budgeting System
PUMA	Precision Underwater Mapping and Navigation
PVO	Private Volunteer Organization
QDR	Quadrennial Defense Review
QOL	Quality of Life
QOS	Quality of Service
R&D	Research and Development
RAM	Rolling Airframe Missile
RAMICS	Rapid Airborne Mine Clearance System
RC	Reserve Component

RCOH	Nuclear Refueling/Complex Overhaul
RD&A	Research, Development,and Acquisition
RCC	Regional Combatant Commander
RDT&E	Research, Development, Test and Evaluation
RF	Radio Frequency
RFP	Request for Proposals
RL	Restricted Line
RM	Radiant Mercury (classified information sanitization program)
RMAST	Reserve Mobile Ashore Support Terminal
RMIG	Radiant Mercury Imagery Guard
RMS	Remote Minehunting System
RNSSMS	Rearchitectured NATO Seasparrow Missile System
RO	Reverse Osmosis
ROS	Reduced Operating Status
RRDD	Risk Reduction and Design Development
RSOC	Regional SIGINT Operations Center
RTC	Remote Terminal Component, or, Recruit Training Command
RWR	Radar Warning Receiver
S&T	Science and Technology
SA	Situational Awareness
SAG	Surface Action Group
SAHRV	Semiautonomous Hydrographic Reconnaissance Vehicle
SAIC	Science Applications International Corporation
SALTS	Streamlined Alternative Logistic Transmission System
SAM	Surface-to-Air Missile
SAML	Security Assertion Markup Language
SATCOM	Satellite Communications
SCA	Software Communications Architecture
SCC	Sea Combat Commander
SCI	Sensitive Compartmented Information
SCN	Shipbuilding and Conversion (Navy) [funding]
SDAP	Special Duty Assignment Pay
SDD	System Development and Demonstration (phase)
SDTS	Self-Defense Test Ship
SDV	Swimmer (or SEAL) Delivery Vehicle
SDVT	Swimmer (or SEAL) Delivery Vehicle Team
SEAD	Suppression of Enemy Air Defense
Seabee	Naval Construction Battalion
SEAL	Sea-Air-Land Naval Special Warfare Forces
SEAPRINT	Systems Engineering, Acquisition,and Personnel Integration
SEI	Specific Emitter Identification
SEIE	Submarine Escape Immersion Equipment
SELRES	Selected Reserve
SHARP	Shared Reconnaissance Pod
SHF	Super High Frequency
SHUMA	Stochastic Unified Multiple Access
SI	Special Intelligence
SIAP	Single Integrated Air Picture
SIGINT	Signals Intelligence
SIMAS	Sonar In-situ Mode Assessment System
SINCGARS	Single Channel Ground and Air Radio System
SIPRNET	Secret Internet Protocol Router Network
SLAD	Slewing-Arm Davit
SLAM	Standoff Land-Attack Missile
SLAM-ER	Standoff Land-Attack Missile-Expanded Response
SLAP	Service Life Assessment Program
SLBM	Submarine-Launched Ballistic Missile
SLEP	Service Life Extension Program
SLR	Side-Looking Radar
SM	Standard Missile
SMCM	Surface Mine Countermeasure
SNAP	Shipboard Non-tactical ADP Program
SOA	Sustained Operations Ashore
SOAD	Standoff Outside Area Defense
SOAP	Simple Object Access Protocol
SOC	Special Operations Cable, also Special Operations Craft
SOF	Special Operations Forces
SOPD	Standoff Outside Point Defense
SOSUS	Sound Surveillance System
SPAWAR	Space and Naval Warfare Systems Command
SPECAT	Special Category
SRB	Selective Reenlistment Bonus
SRC	Submarine Rescue Chamber
SRDRS	Submarine Rescue Diving Recompression System
SS-SPY	Solid State- SPY (radar)
SSEE	Ship's Signals Exploitation Equipment
SSI	Special Structural Inspection
SSI-K	Special Structural Inspection-Kit
SSIPS	Shore Signal and Information Processing Segment
SSBN	Nuclear-Powered Ballistic Missile Submarine
SSG	Strategic Studies Group
SSGN	Guided Missile Submarine
SSDS	Ship Self-Defense System
SSK	Diesel-electric/advanced air independent Submarine
SSMIS	Special Sensor Microwave Imager/Sounder (Air Force)
SSN	Nuclear-Powered Submarine
SSO	Special Security Office
SSST	Supersonic Sea-Skimming Target
START	Strategic Arms Reduction Treaty
STEP	Standardized Tactical Entry Point
STOM	Ship-To-Objective Maneuver
STOVL	Short Take-Off and Vertical Landing
STT	Submarine Tactical Terminal
STU-III/R	Secure Telephone Unit, Third Generation, Remote Control Interface
SURTASS	Surveillance Towed Array Sensor System
S-VSR	S-Band Volume Search Radar
SWAN	Shipboard Wide-Area Network

SWATH	Small Waterplane Area, Twin Hull [Ship]
SYSCEN	Systems Center
T-AGOS	Ocean Surveillance Ship (MSC-operated)
T-AGS	Oceanographic Survey Ships (MSC/Civilian Agency-operated)
T-AH	Hospital Ship
T-AKE	Stores/Ammunition Ship
T-AO	Oiler (MSC-operated)
TACAIR	Tactical Aircraft
TACAMO	Take-Charge-and-Move-Out
TACC	Tactical Air Command Centers
TADIL-J	Tactical Digital Information Link - Joint Service
TACS	Tactical Air Control System
TACTAS	Tactical Towed Array System
TACTOM	Tactical Tomahawk
TADIRCM	Tactical Aircraft Directed Infra-Red Countermeasure
TADIXS	Tactical Data Information Exchange Systems
TAMD	Theater Air and Missile Defense
TAMPS	Tactical Automated Mission Planning System
TAOC	Tactical Air Operations Center (Marine Corps)
TAP	Tactical Training Theater Assessment Planning
TARPS	Tactical Airborne Reconnaissance Pod System
TCDL	Tactical Common Data Link
TCGR	Track Control Group Replacement
TCP	Transmission Control Protocol
TCS	Tactical Control System, or, Time-Critical Strike
TCT	Time-Critical Targeting
TDA	Tactical Decision Aid
TDD	Target Detection Device
TDLS	Tactical Data Link System
TDMA	Time Division Multiple Access
TDSS	Tactical Display Support System
TECHEVAL	Technical (Developmental) Evaluation
TEMPALT	Temporary Alteration
TERCOM	Terrain Contour Mapping
TES-N	Tactical Exploitation System - Navy
TESS/NITES	Tactical Environmental Support System/Navy Integrated Tactical Environmental Subsystem
TFW	Task Force Web
TIBS	Tactical Information Broadcast Service
TIDS	Tactical Integrated Digital System
TIMS	Training Integrated Management System
TIS	Trusted Information System
TLAM	Tomahawk Land-Attack Cruise Missile
TLR	Top Level Requirements
TOA	Total Obligational Authority, or, Tables of Allowance (Seabee)
TOW	Tube-launched, Optically-tracked, Wire-guided (missile)
TRAFS	Torpedo Recognition and Alertment Functional Segment
T-RDF	Transportable - Radio Direction Finding
TRIXS	Tactical Reconnaissance Intelligence Exchange System
TS	Top Secret
TSC	Tactical Support Center
TTWCS	Tactical Tomahawk Weapon Control System
TUSWC	Theater Undersea Warfare Commander
UAV	Unmanned Aerial Vehicle
UCAV	Unmanned Combat Air Vehicle
UDDI	Universal Description, Discovery, and Integration
UFO	Ultra High Frequency Follow-On
UHF	Ultra High Frequency
UOES	User Operational Evaluation System
UNITAS	Annual US - South American Allied Exercise
UNREP	Underway Replenishment
USD/AT&L	Under Secretary of Defense for Acquisition, Technology, and Logistics
USPACOM	United States. Pacific Command
URL	Unrestricted Line
USS	Undersea Surveillance System,and, United States Ship
USSOCOM	U.S.Special Operations Command
USW	Undersea Warfare
UUV	Unmanned Undersea Vehicle
UWS	Underwater Segment
UXO	Unexploded Ordnance
VCNO	Vice Chief of Naval Operations
VERTREP	Vertical (underway) Replenishment
VHA	Variable Housing Allowance
VIXS	Video Information Exchange System
VLF/LF	Very low frequency/low frequency
VLS	Vertical Launching System
VME	Versa Module Eurocard
VPN	Virtual Private Network
VSR	Volume Search Radar
VSW	Very Shallow Water
V/STOL	Vertical/Short Take-Off and Landing
VTOL	Vertical Take-Off and Landing
VTC	Video Teleconferencing
VTM	Video Tele-Medicine
VTT	Video Tele-Training
VTUAV	Vertical Takeoff and Landing Tactical Unmanned Aerial Vehicle
VVD	Voice-Video-Data
WAA	Wide Aperture Array
WAN	Wide Area Network
WDL	Weapons Data Link
WEN	Web-Enabled Navy
WGS	Wideband Gapfiller Satellite
WMD	Weapons of Mass Destruction (nuclear, biological, chemical)
WMP	Wideband Modernization Plan
WPN	Navy Weapons Procurement (appropriation)
WSC	Wideband Satellite Communications
XML	Extensible Markup Language
ZBR	Zero-Based Review

Appendix C
Index of Programs

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