U.S. NAVY

PROGRAM GUIDE 2012

FOREWORD

The U.S. Navy is the world's preeminent maritime force. Our fleet operates forward every day, providing America offshore options to deter conflict and advance our national interests in an era of uncertainty.

As it has for more than 200 years, our Navy remains ready for today's challenges. Our fleet continues to deliver credible capability for deterrence, sea control, and power projection to prevent and contain conflict and to fight and win our nation's wars. We protect the interconnected systems of trade, information, and security that enable our nation's economic prosperity while ensuring operational access for the Joint force to the maritime domain and the littorals.

Our Navy is integral to combat, counter-terrorism, and crisis response. Our aircraft carriers and air wings accounted for about 30 percent of the close air support for forces in Iraq and Afghanistan, and a larger share of the electronic support to prevent IED attack. In the past year, Navy SEALs led a Joint force in actions resulting in the demise of Osama bin Laden, while submarines and destroyers launched over 100 Tomahawk missiles at Libyan military targets during Operation ODYSSEY DAWN. Naval forces brought relief to our Japanese allies after a devastating Tsunami and responded to natural disasters from Haiti to the Philippines. On any given day, more than 40,000 Sailors and 40 percent of our ships are deployed to fight our wars and respond to crises.

Going forward, the importance of naval forces will grow as our ground forces return from the Middle East, our nation rebalances towards the Asia-Pacific, and dynamic political change continues in the Arab world. Nations like Iran and North Korea continue to pursue nuclear capabilities, while rising powers are rapidly modernizing their militaries and investing in capabilities to deny freedom of action on the sea, in the air and in cyberspace. To ensure we are prepared to meet our missions, I will continue to focus on my three main priorities: 1) Remain ready to meet current challenges, today; 2) Build a relevant and capable future force; and 3) Enable and support our Sailors, Navy Civilians, and their Families. Most importantly, we will ensure we do not create a "hollow force" unable to do the mission due to shortfalls in maintenance, personnel, or training.

These are fiscally challenging times. We will pursue these priorities effectively and efficiently, innovating to maximize our forward presence, evolve our war fighting capability, and remain ready for today's challenges. The Navy will continue to dominate the undersea domain, we will sustain Joint operational access through concepts such as Air-Sea Battle, and we will fully employ cyberspace and the electromagnetic spectrum.

The FY 2013 Navy Program reflects a balance between resources and risk. Through innovation, efficiency, and a judicious application of our resources, I am confident our Navy will maintain its place as the world's most lethal, flexible, and capable maritime force.

Jonathan W. Greenert
Admiral, U.S. Navy
Chief of Naval Operations

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MEETING TODAY'S CHALLENGES AND PREPARING FOR THE FUTURE

Our challenge is to apply seapower in a manner that protects U.S. vital interests even as it promotes greater collective security, stability, and trust.

A Cooperative Strategy for 21st Century Seapower

Today's dramatic international landscape and federal budget challenges present a complex set of concerns for the Navy to address in the FY2013 Navy Program. As described in the new defense strategic guidance, the Department of Defense is committed to reducing budgets by more than $450 billion over the next decade. The Arab Awakening and the associated military operation in Libya put a new emphasis on offshore options to influence events abroad. American ground forces withdrew from Iraq after eight years of operations and are drawing down in Afghanistan, placing new pressures on naval forces to deter aggression and support our new and enduring partners in the Middle East and South Asia. And the nation is rebalancing toward the Asia-Pacific region, an inherently maritime theater where America's expeditionary military and diplomatic capabilities will rely largely on the sea.

The growing demand for naval forces and an increasingly constrained fiscal environment require hard choices today - and will require the Navy to evolve and innovate for the future. For today, the FY2013 Navy Program emphasizes ready warfighting capability and preserves the fleet's capacity for presence in key regions such as the Middle East and Asia Pacific. At the same time, the FY2013 Navy Program accepts risk in the fleet's capacity to operate outside these key regions or perform missions that fall outside the Navy's core responsibilities. For the future, the FY2013 Navy Program sustains the evolution in Naval capabilities to continue dominating the undersea domain, more effectively employ cyberspace and the electromagnetic spectrum and assure Joint operational access through the Air-Sea Battle concept.

The Navy will have to get the most forward presence possible from the fleet we can afford to build and maintain. The FY2013 Navy Program increases investment in unmanned systems to expand the reach and persistence of today's manned ships and aircraft. The fleet will also take advantage of forward sites such as Djibouti, the Philippines or Diego Garcia to rest, resupply, repair, and refuel. The FY2013 Navy Program will expand our forward-stationed forces with destroyers (DDG) in Rota, Spain, Littoral Combat Ships (LCS) in Singapore, and Patrol Coastal (PC) ships in Bahrain. Our efforts to maximize forward presence will be tempered by the need to ensure our crews and their ships and aircraft have sufficient time for training and maintenance between deployments so they are ready for their expected operations and our platforms make it to their expected service life. To that end, our FY2013 Navy Program establishes a sustainable level of deployment through the Fleet Readiness and Training Plan (FRTP).

The fleet's primary duty is to be ready to address today's challenges, today. Our FY2013 Navy Program prioritizes investments to ensure the Sailors, ships, and aircraft we deploy every day can counter the threats they may face. As the new defense strategic guidance describes, our military's ability to quickly deny the objectives of an adversary's aggression or impose unacceptable costs on aggressors are essential elements of deterring conflict. The

warfighting capabilities emphasized in the Navy's FY2013 program improve the fleet's readiness and capability to perform these two functions for Combatant Commanders.

While the Navy's characteristics will change, our contribution to the nation's defense will not. The Navy-Marine Corps team will remain critical to our nation's security and prosperity. They will continue to deliver credible capability for deterrence, sea control and power projection to contain conflict and to fight and win our Nation's wars. And naval forces will operate forward with our partners to deter conflict and influence events at the strategic "maritime crossroads" where shipping lanes, energy and information flows, and national interests intersect. These efforts reflect our Maritime Strategy, *A Cooperative Strategy for 21st Century Seapower (CS21)*, whose six strategic imperatives describe our commitment to both prevent conflict and win our nation's wars.

STRATEGIC IMPERATIVES OF OUR MARITIME STRATEGY

- **Deter major power war**
- **Win our nation's wars**
- **Limit regional conflict with forward deployed decisive maritime power**
- **Contribute to homeland defense in depth**
- **Foster and sustain cooperative relationships with more international partners**
- **Prevent or contain local disruptions before they impact the global system**

These imperatives are aligned with America's enduring national security goals as described in the new defense strategic guidance, which identifies several major challenges and opportunities the American military must be prepared to address or take advantage of:

CHALLENGES AND OPPORTUNITIES OF U.S. DEFENSE STRATEGIC GUIDANCE

- **Actively counter violent extremists and destabilizing threats**
- **Rebalance our focus toward the Asia-Pacific**
- **Sustain our presence and support for partners in Middle East and South Asia**
- **Evolve our posture in Europe; pursue new partnerships in Africa, Latin America**
- **Assure freedom of access throughout the global commons**
- **Conduct effective operations to counter the proliferation of WMD**

The new defense strategic guidance also identifies ten missions for the armed forces and defines the operations the force must be sized to conduct. In particular, the strategy requires the military be able to counter terrorist threats, deter and defeat aggression, sustain a safe and effective nuclear deterrent, and defend the homeland.

The Navy supports these missions through its core capabilities, which are described in *CS21*.

CORE CAPABILITIES

Our investments in FY2013 are designed to deliver ready capabilities to Combatant Commanders. The Navy's capabilities can be grouped in six main categories. The first four emphasize enduring Navy activities that deter and win wars. Two additional capabilities were added with *CS21* to highlight those operations that also prevent conflict over the long term. The enduring core capabilities are:

- **Forward Presence**
- **Deterrence**
- **Sea Control**
- **Power Projection**

The expanded core capabilities are:

- **Maritime Security**
- **Humanitarian Assistance and Disaster Response**

As described in the new defense strategic guidance, the fleet may become smaller overall, as we address fiscal constraints while ensuring the force remains ready for today's challenges. We will prioritize forces for enduring missions and presence in the most important regions, such as the Western Pacific and Indian Ocean/Arabian Gulf.

Forward Presence is central to the value of naval forces. Forward deployed naval forces deter adversaries, demonstrate U.S. commitment to our allies and partners, and respond rapidly to tension, coercion, crises and conflicts. The day-to-day operation of sea-based naval forces sustains joint access to forward operating areas, allowing joint forces to overcome geographic and, when necessary, military challenges to access. At the same time, forward operations also foster the international navy-to-navy relationships that may alleviate diplomatic impediments to access.

Forward presence ensures ready forces are available to combatant commanders in support of contingency plans. While in theater, forward deployed naval forces are also essential to the long-term efforts of commanders to shape the security environment in their area of responsibility. These efforts include improving the capability of partners and allies through training and experience in

maritime operations, proactive humanitarian assistance activities, and U.S. government-wide actions to improve host nation government effectiveness.

Our Navy maintains forces forward through the Fleet Readiness and Training Plan (FRTP), which ensures a portion of the fleet is always forward deployed, while an additional portion of the force is available to deploy for crisis response. The FRTP maintains approximately 40% of the fleet forward deployed on a given day. As the fleet becomes smaller, forward presence will be prioritized in the Asia-Pacific and Middle East. In Europe, naval presence will evolve to include Forward Deployed Naval Force (FDNF) ships in Rota, Spain, and Gaeta, Italy, augmented by episodic deployments of other forces. In Africa and Latin America, the Navy will pursue innovative approaches to maintain presence, including using new platforms such as the Joint High Speed Vessel and Littoral Combat Ship, and leveraging places to repair, rest and refuel such as Diego Garcia, Djibouti, and Guantanamo Bay, Cuba.

Deterrence results from the demonstrated ability to deny aggressors their objectives or impose unacceptable costs on them in response. FDNF field conventional defense and strike capabilities to promptly intervene against aggression or retaliate, while nuclear strike capabilities from survivable ballistic missile submarines can impose significant costs on an aggressor. The ability of naval forces to deploy rapidly and indefinitely sustain credible combat power worldwide provides national decision-makers important tools to signal U.S. national resolve. And a credible, forward-deployed combat force underpins assurance to regional allies and partners.

CS21 calls for U.S. naval forces to build confidence and trust among nations through collective security efforts that focus on common threats and mutual interests. By strengthening alliances and partnerships, the United States also enhances the collective ability of allies and partners to deter aggression.

Sea Control is the essence of seapower, consisting of surface warfare, anti-submarine warfare, air and missile defense and mine warfare. Sea control is essential to American military operations abroad. Since those expeditionary operations are highly dependent on long-haul communication and surveillance networks, sea control in the 21st century includes operations in space and cyberspace.

Sea control allows naval forces to protect freedom of navigation, sustain unhindered global maritime commerce, and prevail in war. Sea control is essential to closing within striking distance of land to project power by sending Marines ashore, conducting air strikes and naval gunfire support, and delivering reinforcements and supplies. These actions can in turn neutralize land-based threats to maritime access and enhance freedom of action at sea. Sea control is increasingly important in littoral areas given the defense strategic guidance's emphasis on smaller footprints ashore. Smaller ground force concentrations ashore will require greater support and protection from the sea.

The Combatant Commanders' operational objectives, maritime geography, and capabilities of potential adversaries drive the capability and capacity of naval forces needed to achieve sea control over the required duration and area. While the Navy is capable of overcoming geographic impediments to access, naval forces are increasingly challenged by anti-access and area-denial threats such as submarines, anti-ship missiles, and mines. These threats will require increased emphasis on sea control to assure access for Joint forces and the ability of the United States to influence events abroad.

Power Projection in its broadest sense is the ability of a nation to apply all or some of its elements of national power—political, economic, informational, or military—to effect change in another nation's behavior. Naval forces support each instrument of national power by providing sustainable platforms from which those operations can occur, although they may be conducted by personnel from a number of different government agencies.

The military instrument, however, is what naval forces provide most often to project power. Forward deployed ships and aircraft can effectively deploy and sustain forces in multiple dispersed locations to respond to crises, to contribute to deterrence, and to enhance regional stability. Naval forces project power directly through air and missile strikes, naval gunfire and Marine amphibious capabilities. To support large operations, naval forces can rapidly aggregate when required to form strike forces capable of projecting overwhelming combat power from the sea.

Maritime Security operations are conducted to protect sovereignty and maritime resources, support free and open seaborne commerce, and to counter maritime-related terrorism, weapons proliferation, transnational crime, piracy, environmental destruction, and illegal seaborne immigration. Effective maritime security requires a comprehensive effort to promote global economic stability and protect legitimate ocean-borne activities from hostile or illegal acts in the maritime domain.

The size and complexity of the maritime commons create unique security challenges as terrorists and criminals leverage the easily accessible, unregulated expanse of the maritime domain to mask their illicit activities. Identifying, tracking, and neutralizing these threats are essential to U.S. national security and the global economy. Comprehensive maritime security, however, can only be achieved through the coordinated activities of governments, the private sector, and multinational organizations, including naval and maritime security forces, law enforcement agencies, and customs and immigration officials.

The Navy plays a critical role in facilitating this coordination, and is uniquely manned, trained and equipped to assist allies and partners develop the maritime professionals, infrastructure, awareness and response capabilities that are prerequisites for maritime security. In addition to general purpose naval forces that conduct

a variety of steady-state maritime security operations, the Navy provides unique maritime security capabilities such as maritime expeditionary security forces, riverine squadrons, expeditionary intelligence personnel and civil affairs teams.

Humanitarian Assistance and Disaster Response (HA/DR) activities are conducted proactively (HA) and reactively (DR) to address needs that may not be directly related to national security, but reflect the values and desires of our Nation to render aid and reduce suffering. These operations will include providing preventive or emergent medical care, food and water, basic sanitation, transportation, shelter, and the restoration of public infrastructure. These activities enhance or restore host nation capacity, provide an opportunity to engage with a broader cross-section of the host nation's population, and build relationships that serve to increase trust.

Expeditionary naval forces are uniquely suited to these operations. They are forward deployed, allowing more rapid response. Naval forces are also supported from offshore, allowing them to operate despite the effects of a disaster ashore. Being supported from offshore also minimizes the footprint of forces providing proactive HA, reducing the burden of U.S. operations on the host nation and expanding the area that can be helped.

HA/DR efforts are undertaken alongside the host nation, other participating nations, multinational, regional, and non-governmental organizations, and in close coordination with counterparts at the Department of State, USAID and other federal agencies. Operating without reliance on ports and airfields ashore, and in possession of organic medical support, strategic and tactical lift, logistics support, robust communications capabilities and premier planning and coordination tools, naval forces are well-suited for HA/DR efforts.

OUR PRIORITIES

To deliver these core capabilities to combatant commanders, the Navy is pursuing three main priorities: *Remain ready to meet current challenges, today; Build a relevant and capable future force; and enable and support our Sailors, Navy civilians and their families.* These priorities are enduring and encompass the primary mission of the Navy to organize, train and equip forces to be used by operational commanders. Our top priority is ensuring the deployed force is ready to counter today's threats, both to deter aggression in the most likely areas of conflict, and to ensure the force is not inadvertently "hollowed out" in an attempt to maintain capacity at the expense of readiness.

REMAINING READY TO MEET CURRENT CHALLENGES

Our top priority is ensuring the fleet is ready to address today's challenges. This priority is more than the maintenance and manning of our ships and aircraft. It also includes ensuring the weapons, command and control systems and processes, and surveillance and reconnaissance capabilities are able to address the current threats faced by combatant commanders. As a whole, the U.S. Navy is the world's preeminent maritime fighting force. The challenge is that today's globally deployed Navy must remain ready for the whole range of threats, while potential adversaries can build their capabilities to leverage their unique geography and target warfare areas where they perceive an advantage against U.S. forces. This is particularly true in the case of anti-access and area denial (A2/AD) capabilities designed to prevent U.S. power projection in the adversary's vicinity.

Part of the goal of maintaining readiness, therefore, is making sure the right U.S. capabilities are deployed in the right places to address today's threats in important regions of the world. The FY2013 Navy Program invests in programs to improve our readiness for today's threats, including capabilities in mine countermeasures, anti-submarine warfare, surveillance, and defense against anti-ship missiles.

Sustaining our fleet capacity is one of the most pressing issues facing our Navy over the next decade. Capacity is a function of both the number of platforms and their materiel condition. Ships and aircraft with poor material condition are unable to deploy effectively and also are less likely to last their full expected service life, causing a future capacity shortfall. Naval forces maintain their readiness by resetting "in stride," conducting required maintenance, modernization, and training, between regularly-scheduled deployments..

In addition to adequate maintenance funding, ships and aircraft must be afforded the time to conduct maintenance between deployments. Demand for naval forces today exceeds supply, causing ships to deploy longer and more frequently than a decade ago. Since 2001, for example, the number of annual underway days per ship rose by 15 percent. Meeting this growing demand required cutting short some maintenance periods and deferring others. To ensure ships and aircraft are able to be maintained between deployments, the FY2013 Navy Program establishes a more sustainable level of deployment. This may affect the amount of overseas presence the Navy can provide, but in accordance with the defense strategic guidance, the Navy will prioritize deployments of combat-credible forces in the Western Pacific and the Middle East, ballistic missile defense to Europe, and globally distribute mission-tailored forces elsewhere.

Energy efficiency is increasingly important to maintaining a forward deployed naval force. Each gallon of fuel for a conventionally

powered ship must be brought to it by another ship or provided during a port call. The price of that fuel, if petroleum-based, is volatile. Oil prices, for example, increased more than $30 per barrel since 2001. To improve the operational energy efficiency of the force, we are investing in new technologies such as hybrid-electric drive and all-electric ships.

BUILDING A RELEVANT AND CAPABLE FUTURE FORCE

The second priority is modernization and procurement to create the future force. In the FY2013 Navy Program, some reductions in fleet capacity were accepted to ensure the force retained the capability to address today's challenges. The last ten years of conflict in the Middle East, and increased operations around the world, have placed heavy stress on our Fleet. At the same time these demands grew, the size of the fleet was decreasing. To maximize fleet capacity affordably while maintaining our readiness, our FY2013 Navy Program sustains production of today's proven platforms and maximizes the use of multi-year contracts for platform procurement.

To get the most reach and persistence out of each of those aircraft and ships, our force development efforts will emphasize new and improved weapons, sensors and unmanned vehicles to deploy from manned platforms. A number of unmanned systems are included in the Navy FY2013 program, as are improvements to the Joint Standoff Weapon (JSOW), *Harpoon* anti-ship missile, Mk-48 and Mk-54 torpedoes and a number of weapons to counter terrorist and small boat threats. To improve the reach of our existing *Arleigh Burke*-class destroyers (DDG), we are investing in the Advanced Missile Defense Radar (AMDR). Our DDGs and aircraft carriers (CVN) will also gain range and capability with the introduction of new MH-60R and MH-60S *Seahawk* helicopters, which incorporate improved weapons and sensor payloads for surveillance and reconnaissance, surface warfare, and anti-submarine warfare.

The most concerning area for naval capability development is the fielding of A2/AD capabilities by nations and non-state groups. These capabilities include mines, submarines, anti-ship cruise and ballistic missiles, anti-satellite weapons, and communications jamming. These weapons are designed to support aggression and coercion against neighbors while preventing intervention by U.S. or allied forces. The FY2013 Navy Program invests in research and development efforts and procurement programs to overcome these threats to access, and assure the ability of the Joint force to project power in support of our allies and partners and protect U.S. interests.

An important element of overcoming threats to access and maximizing the fleet's capacity is unmanned systems. In the near-term, land-based Broad Area Maritime Surveillance (BAMS) aircraft

will provide the ability to monitor more than 40,000 square miles of ocean per day, while sea-based MQ-8B *Firescout* and the *Scan Eagle* unmanned air systems (UAS) will be augmented by a longer-range, MQ-8 UAS. In the mid-term, we are building the first demonstrators of the Unmanned Carrier-Launched Air Surveillance and Strike System (UCLASS) to extend the reach of CVNs and improve their capability in extreme anti-access environments. The FY2013 Navy Program also accelerates the development of unmanned undersea vehicles that will help maintain our dominance of the undersea domain. These new capabilities require intense collaboration, internally and with our joint and industry partners, to improve the speed of delivering game-changing technology to warfighters.

We continue to develop and strengthen our ability to influence, deny, degrade, disrupt, or destroy enemies in the information, electromagnetic, and cyber domains. Investments in ashore and afloat transport networks, information assurance, cyber security, electronic warfare, and associated human expertise and tools will improve our ability to operationalize the electromagnetic spectrum and cyberspace as warfighting domains.

To maintain credible U.S. naval presence and combat power in the Arabian Gulf/Indian Ocean and Western Pacific, our FY2013 Navy Program invests in *Ford* and *Nimitz*-class CVNs for power projection, surface warfare, and air and missile defense; *America*-class amphibious assault ships (LHA) for power projection; *Arleigh Burke*-class DDGs for air and missile defense, anti-submarine warfare, surface warfare, and power projection; and *Virginia*-class submarines for surveillance, anti-submarine warfare, surface warfare and power projection. Naval forces at sea will be supported and protected by land-based P-8A *Poseidon* multi-mission aircraft and BAMS UAS for surveillance, anti-submarine warfare and surface warfare. To complement the conventional deterrence capability of CVNs, DDGs, and SSNs, the FY2013 Navy Program sustains investment in *Ohio*-class ballistic missile submarines and their replacements, the most survivable leg of the nuclear deterrent triad.

To provide for counter-piracy, counterterrorism, mine warfare, ASW, and security cooperation in the littorals, we continue procurement of the LCS, already shown to be effective in deployments to South America and in Pacific exercises with maritime partner nations. In addition, the Joint High Speed Vessel (JHSV) will steadily expand our capacity to conduct security cooperation and training with partners, support operations ranging from HA/DR to major combat, and establish a "sea base" from which to operate. The FY2013 Navy Program also includes a Mobile Landing Platform (MLP) to be outfitted as an afloat forward staging base to support mine countermeasure, counter-piracy and counterterrorism operations.

ENABLE AND SUPPORT OUR SAILORS AND NAVY CIVILIANS

Achieving the objectives of the new defense strategic guidance and *CS21* would be impossible without the skill, character, talent, and innovative spirit of our sailors and Navy civilians. Navy's warfighters, both active and reserve, are the most highly trained, motivated, and educated force we have ever employed. They are vital to our success, as are the families who support our Sailors while they are deployed across the globe.

Developing and challenging our people includes giving them the training and education to meet our global challenges. Our FY2013 Navy Program sustains investment in high-fidelity trainers and simulators to ensure our Sailors keep their competitive advantage in operating advanced and complex technical systems. Synthetic training allows the crews of multiple ships and aircraft to participate together in training events, practicing complex real-world operations that would be almost impossible to duplicate with actual platforms. In addition to simulating difficult tactical situations, synthetic trainers also reduce the wear and tear and operational expenses of using actual platforms for training.

In the current economic environment, the Navy has a unique manpower challenge. Retention is at an all-time high, attrition is low, and highly-qualified people continue to want to join the service. We will continue using force shaping tools such as Perform-to-Serve to ensure the best performers remain in the Navy and prevent overmanning of enlisted specialties. Going forward, we will continue to monitor our manpower situation and work to avoid having to force personnel out to meet end strength requirements.

The FY2013 Navy Program maintains investment in strong family support programs and quality housing, including Homeport Ashore opportunities for Sailors. We will sustain momentum in important personnel readiness, child development, and youth programs. Increased deployment intensity and dangerous duty assignments have heightened the importance of caring for the mental, emotional, and financial well-being of returning warriors and their families. We will maintain our support for warriors through world-class medical assistance, exemplified by such programs as Families OverComing Under Stress (FOCUS) and Overcoming Adversity and Stress Injury Support (OASIS). Safe Harbor will continue to coordinate non-medical care for wounded, ill, and injured Sailors and their families, to speed recovery, rehabilitation, and reintegration.

CONCLUSION

The United States is, and will remain, a maritime Nation whose security and economic interests lie well beyond our shores. The need for strong naval forces to maintain influence at strategic maritime crossroads will only grow in importance for the foreseeable future. A strong, relevant Navy will continue to be necessary to provide offshore options to deter conflict, and if necessary, win our nation's wars.

As we enter 2012, there are more than 12,100 Sailors on the ground and another 12,000 offshore in support of Joint and coalition operations in the Central Command AOR. Our national interests, however, are global. On any given day in 2012 there will be more than 40,000 Sailors deployed and almost half of our 285 ships underway around the world. These ships, aircraft, and Sailors will conduct deterrence, counterterrorism, counter-piracy, and humanitarian assistance operations each day, while standing by to combine with coalition and Joint forces for highly integrated operations to defeat aggression and support our allies and partners. Naval forces will continue to be flexible, scalable, and adaptable, from a single Sailor serving in a Provincial Reconstruction Team (PRT) on the ground in Afghanistan to a multi-ship aircraft carrier strike group operating halfway around the globe.

Most importantly, our strength resides in the skills, character, talents, innovation, motivation, and dedicated service of our people. Our commitment to them, and investments in them, uniformed and civilian, active and reserve, and Navy families, remain the foundation of the world's preeminent maritime force.

The following sections of the 2012 Program Guide describe the programs that the Navy has fielded and is currently developing, which enable the capabilities described above. While some programs contribute significantly to a single capability, many of them are designed to and are capable of supporting multiple core capabilities and mission requirements. The strength of the Navy's forces lies in their adaptability and flexibility across the range of military operations.

SECTION 1
NAVAL AVIATION

Naval Aviation is a critical component of the Nation's ability to carry out full-spectrum operations in the 21st Century—from delivering humanitarian assistance and disaster relief at home and overseas… to maritime security operations to ensure safe passage of commercial vessels…to high-intensity sea control and power projection in a major contingency. Helicopters and fixed-wing aircraft operating from nuclear aircraft carriers, large-deck amphibious ships and shore stations, and helicopters operating from cruisers and destroyers—complemented by advanced unmanned aerial vehicles—are key contributors to the capabilities of the U.S. Navy and Marine Corps.

AIRCRAFT CARRIERS

CVN 68 Nimitz-Class and CVN 78 Ford-Class Aircraft Carrier Programs

Description

The U.S. Navy's force of nuclear-powered aircraft carriers provides the operational flexibility and warfighting capability to meet all Fleet Response Plan commitments, as well as the combatant commanders' requirements for persistent presence in support of national goals. The FY 2010 National Defense Authorization Act authorized a temporary reduction in the carrier fleet to ten ships between the November 2012 inactivation of USS Enterprise (CVN 65), after more than 50 years of service, and the planned commissioning of Gerald R. Ford (CVN 78) in 2015.

The mission of the aircraft carrier is to support and operate air wing aircraft that conduct attack, early warning, surveillance, and electronic missions against sea-borne, air-borne, and land-based targets in support of joint and coalition forces. America's carriers deploy throughout the world in direct support of U.S. strategy and commitments. Additionally, our carriers continue to play an increasingly important role as the Navy continues to emphasize operations in the world's littorals. This becomes particularly important as forward-deployed land-based forces are brought home to the United States. To maintain a constant 11-aircraft carrier force throughout the long term, aircraft carriers are replaced on a one-for-one basis, with a new ship planned for introduction into the fleet coincident with an inactivation, approximately every five years, starting with the delivery of John F. Kennedy (CVN 79) in FY 2022.

CVN 78 is the first of a new class of aircraft carriers in almost 40 years. While nearly identical in size to Nimitz-class carriers, Ford-class ships are designed with upgraded hull, mechanical, electrical, and electronics capabilities. This class of aircraft carriers will also incorporate such advanced features as a new, more efficient nuclear propulsion plant, an Electro-Magnetic Aircraft Launch System (EMALS), Advanced Arresting Gear (AAG), Dual-Band Radar (DBR), and a nearly three-fold increase in electrical generation capacity compared to a Nimitz-class carrier. These technological improvements, along with a slightly expanded flight deck and other topside changes designed to increase operational efficiency, will provide significantly higher sortie generation rates. At the same time, maintenance and manpower requirements for the ship will be greatly reduced from today's needs, allowing the Navy to reap more than $5 billion dollars in life-cycle cost savings per ship throughout its 50-year service life. The follow-on ships, CVN 79 and CVN 80, will be built as modified repeats of CVN 78, and are expected to deliver to the fleet in 2022 and 2027, respectively. Subsequent hulls will be built at five-year intervals, with the plan providing for the insertion of new technologies that have evolved in the previous decades.

Status

With the delivery of USS George H. W. Bush (CVN 77), the tenth and final ship of the Nimitz class, coupled with the de-commissioning of Kitty Hawk (CV 63) after more than 48 years of service, the Navy's aircraft carrier fleet is exclusively nuclear powered. Construction of Gerald R. Ford, the lead ship in the CVN 78 Program, was approximately 33 percent complete in early 2012 at Huntington Ingalls Industries (HII), Newport News Shipbuilding. The ship is scheduled for delivery to the Navy in September 2015.

Developers

Huntington Ingalls Industries (HII) Newport News, Virginia

AIRCRAFT

AH-1Z and UH-1Y Upgrades

Description

The H-1 Upgrade Program replaces the UH-1N and AH-1W aircraft with new UH-1Y and AH-1Z four-bladed, all-composite rotor system helicopters. The program will ensure that the Marine Air-Ground Task Force (MAGTF) possesses credible rotary-wing (helicopter) attack and utility support platforms for the next 20 years. The H-1 Upgrade Program will reduce life-cycle costs, significantly improve operational capabilities, and extend the service lives of both aircraft. There is 84 percent commonality between the two aircraft that will greatly enhance the maintainability and deployability of the systems, with the capability to support and operate both aircraft within the same squadron structure.

The upgrade program includes a new, four-bladed, all-composite rotor system, coupled with a sophisticated, fully-integrated "glass cockpit." The program also incorporates a performance-matched transmission, four-bladed tail rotor drive system, and upgraded landing gear. The integrated glass cockpit with modern avionics systems will provide a more lethal platform as well as enhanced joint interoperability. Operational enhancements include a dramatic increase in range, speed, survivability, payload, and lethality of both aircraft, with a significant decrease in the logistics footprint. The UH-1Y will operate at nearly twice the in-service range, with more than double the payload. The AH-1Z will realize similar performance increases, with the ability to carry twice the in-service load of precision-guided munitions.

Status

In early 2012, 131 H-1 Upgrade aircraft are on contract (89 UH-1Y, 34 AH-1Z and 8 AH-1Z Build New), with 50 UH-1Ys and 20 AH-1Zs delivered as of October 2011. The FY 2013 budget requests 27 H-1 Upgrade aircraft in FY 2013. The last 50 aircraft have delivered an average of 34 days ahead of contract schedule at Bell Helicopter's production facility in Amarillo, Texas.

AH-1Z Full Rate Production (FRP) was achieved on November 28, 2010, and at the same time the H-1 Upgrades program was designated ACAT-1C. AH-1Z Initial Operational Capability (IOC) was attained February 24, 2011, and the first deployment of the new attack helicopter started with the 11th MEU in November 2011. The MEU detachment represents another program first, as it is the first "all Upgrades" (UH-1Y/AH-1Z) deployment. The UH-1Y made its initial deployment with the 13th MEU from January-June 2009 and has conducted sustained combat operations in *Operation Enduring Freedom (OEF)* since November 2009.

Both the UH-1Y and AH-1Z have been aggressively deployed ahead of their respective Material Support Dates (MSD), in an effort to support our deployed troops with the most capable aircraft available. Despite the associated strain on the supply system, deployed readiness of H-1 Upgrades aircraft has been high. The H-1 Upgrades Program of Record consists of 160 UH-1Ys and 189 AH-1Zs.

Developers

Bell Helicopter Textron	Fort Worth, Texas
	Amarillo, Texas

AV-8B *Harrier II+*

Description

The AV-8B *Harrier II* is a single-seat, light attack aircraft that supports the MAGTF commander by engaging surface targets and escorting friendly aircraft, day or night, under all weather conditions during expeditionary, joint, or combined operations. 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 Forward Operating Bases (FOBs)), and damaged conventional airfields. Two variants of the aircraft are in service: the Night Attack and the Radar/Night-Attack *Harrier*. The Night-Attack *Harrier* improved the original AV-8B design through incorporation of a Navigation, Forward-Looking InfraRed (NAVFLIR) sensor, a digital color moving map, night vision goggle compatibility, and a higher performance engine. The in-service 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 II+* to be responsive to the MAGTF's needs for expeditionary, night, and adverse-weather offensive air support.

Status

The Operational Flight Program (OFP) H5.0 integrated the Dual Mode Laser Guided Bomb, centerline LITENING pod carriage, which provides tremendous improvements in Radar and LITENING Advanced Targeting Pod capability. FY 2011 saw the comple-

tion of testing of OFP H6.0, integrating digital improved triple-ejector racks for increased carriage capacity for Joint Direct Attack Munition (JDAM), fully integrated ALE-47 expendable hardware and software, adjustments for improving moving target engagements, improved radar capability, and safety improvements, as well as AIM-120 A/B flight clearance. The AV-8B continues to maximize integration of the LITENING Advanced Targeting Pod, a third-generation dual TV/Infrared sensor providing target recognition and identification, laser designation, and laser spot tracking for precision targeting capability. Work on H6.1 operational flight program is underway and will offer fourth-generation LITENING, in-weapon laser capability for JDAM and Laser JDAM, moving target calculations for increased laser JDAM effectiveness, as well as software improvements. LITENING Pods have also been equipped with a video downlink, which enables real-time video to be sent to ground-based commanders and forward air controllers. This facilitates time-sensitive targeting and reduces the risk of fratricide and collateral damage.

Developers

Boeing	St. Louis, Missouri

C-130T *Hercules*

Description

The Navy C-130T *Hercules*, a component of the Navy Unique Fleet Essential Airlift (NUFEA) complement, provides heavy, over-and-outsized lift capability. These aircraft are deployed worldwide, and provide rapid response direct support to the Navy's component commanders theater requirements. This aircraft can be rigged/re-rigged within minutes to transport up to 40,000 pounds of cargo or up to 75 passengers.

Status

The Navy has begun a program to upgrade its C-130T aircraft to meet all communications navigation surveillance/air traffic management (CNS/ATM) requirements. In early 2012, aircraft are stationed at NAS Jacksonville, Florida; NAS JRB New Orleans, Louisiana; NAF Washington, DC; NBVC Point Mugu, California; and Joint Base McGuire/Dix/Lakehurst, New Jersey.

Developers

Lockheed Martin	Bethesda, Maryland
Lockheed Martin	Marietta, Georgia

C-2A *Greyhound*

Description

The C-2A *Greyhound* is the Navy's sole carrier-based medium-lift/long-range logistics support aircraft, providing time-critical support to Carrier Strike Groups (CSG). Its primary mission is transport of high-priority cargo, mail, and passengers between the CSG and shore support bases. A high-wing monoplane powered by twin Allison T56-A-425 turboprop engines and Hamilton-Standard constant-speed propellers, the C-2A can deliver a combined payload of 10,000 pounds to a distance in excess of 1,000 NM. The interior arrangement of the cabin can readily accommodate cargo, passengers and litter patients. Priority cargo such as jet engines or components can be transported from shore to ship in a matter of hours. A cargo cage system or transport stand provides restraint for loads during catapult launches and arrested landings. The large aft cargo ramp/door allows for straight-in rear cargo loading and unloading for fast turnaround. The C-2A is capable of airdropping both supplies and personnel. Its onboard auxiliary power unit provides autonomous engine starting capability and ground power self-sufficiency at austere bases, providing operational versatility.

Status

In early 2012, the aircraft is undergoing a Service Life Extension Program (SLEP) to increase operating service life from 15,020 landings and 10,000 flight hours to 36,000 landings and 15,000 flight hours. The changes being incorporated include structural enhancements, aircraft rewire, cockpit avionics systems improvements, and a new 8-blade propeller system (NP2000). SLEP will make the C-2A a viable and maintainable platform until it is replaced in approximately 2026. As mandated by Congress and CNO, two passenger-carrying safety requirements have been integrated into the C-2A: Traffic Alert and Collision Avoidance System (TCAS) and Terrain Awareness Warning System (TAWS). Additionally, a modernized braking system is being installed to improve the ground handling characteristics of the aircraft. An Analysis of Alternatives (AoA) is exploring re-capitalization options.

Developers

Northrop Grumman — Bethpage, New York

C-37 Executive Transport

Description

The Navy maintains executive transport airlift in accordance with DoD Directive 4500.56. Senior leaders require air transport that has secure communications capability. In 2012, three C-37Bs (Gulfstream 550), one C-37A (Gulfstream V), two C-20Ds (Gulfstream III), and one C-20A (Gulfstream III) provide executive transport services. The C-37A/B aircraft have replaced the VP-3A, substantially lowering operating costs. The C-37A/B meets all known international-imposed air traffic management communications, navigation, and surveillance requirements through FY 2014.

Status

The first C-37 aircraft was delivered in 2002. A second aircraft was delivered in 2005, and two more were delivered in 2006. The first aircraft, the Navy's only C-37A, is now based at Hickam AFB, Hawaii, and supports Commander Pacific Fleet (PACFLT). The C-37Bs are based at NAF Washington, DC and are assigned to Fleet Logistics Support Squadron One (VR-1). Additionally, the Navy acquired a surplus C-20A from the Air Force in order to meet Commander Naval Forces Europe (CNE) executive transportation requirements.

Developers

Gulfstream (Division of General Dynamics) Savannah, Georgia

C-40A *Clipper*

Description

The Naval Air Force Reserve provides 100 percent of the Navy's organic intra-theater logistics airlift capability via its Navy Unique Fleet Essential Airlift (NUFEA). NUFEA provides Navy component commanders with short-notice, fast response intra-theater logistics support for naval power projection worldwide. Twelve C-9B 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 aircraft (not to be confused with Executive/VIP transport) can transport 121 passengers (passenger configuration), 40,000 pounds of cargo (cargo configuration) or a combination of the two (combination configuration), at ranges greater than 3,000 NM at Mach 0.8 cruise speed. The ability to carry cargo pallets and passengers simultaneously maximizes the operational capability, safety, and capacity. The C-40A has 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.

Status

Twelve aircraft are in the inventory in early 2012, with an additional aircraft expected to be on contract. The Navy has purchased the aircraft via commercial-off-the shelf (COTS) standards using standard best commercial practices. C-40A squadrons are located at NAS JRB Fort Worth, Texas; NAS Jacksonville, Florida; NAS North Island, California; and NAS Oceana, Virginia.

Developers

Boeing Seattle, Washington

CH-53K Heavy Lift Replacement (HLR)

Description

The CH-53K is the follow-on to the Marine Corps CH-53E Heavy Lift Helicopter. Major systems improvements of the newly manufactured helicopter include new, greater-horsepower and more-capable engines, expanded gross weight airframe, drive train, advanced composite rotor blades, modern interoperable cockpit, external and internal cargo handling systems, and enhanced survivability. The CH-53K 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 cargo in a landing zone at a pressure altitude of 3,000 feet at 91.5° Fahrenheit, a capability improvement that nearly triples the in-service CH-53E abilities under the same conditions. Additionally, the CH-53K will be capable of carrying a normal load of 30 combat-loaded troops.

The CH-53K's increased capabilities are essential to meeting the Marine Expeditionary Brigade of 2015 Ship-to-Objective Maneuver (STOM) vision and it fully supports the Joint Operations Concept of Full Spectrum Dominance by enabling rapid, decisive operations and the early termination of conflict by projecting and sustaining forces to distant anti-access, area-denial environments. 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.

Status

The Post Milestone (MS) B System Development and Demonstration (SDD) contract of $2.7 billion was awarded to Sikorsky Aircraft Corporation on April 5, 2006. The program conducted its Preliminary Design Review during the fourth quarter of FY 2008. The Critical Design Review was successfully completed ahead of schedule in the third quarter of FY 2010, and the program has now transitioned from the design to the manufacturing phase. The first Ground Test Vehicle is in production with engine light-off projected for spring 2012 and first flight projected for spring 2013. The Marine Corps requirement remains 200 aircraft.

Developers

Sikorsky Aircraft Corporation — Stratford, Connecticut

EA-18G *Growler* Airborne Electronic Attack Aircraft

Description

The EA-18G *Growler* will replace the Navy's EA-6B *Prowler*. Like the *Prowler*, the EA-18G will provide full-spectrum electronic attack to counter enemy air defenses and communication networks. The *Growler* maintains a high degree of commonality with the F/A-18F, retaining the latter's inherent strike-fighter and self-protection capabilities while providing air-to-air self-protection to free other assets for other strike-fighter tasking.

Status

The EA-18G *Growler* reached Initial Operational Capability (IOC) in September 2009 and is currently in Full Rate Production. In December 2009, the Department of Defense made the decision to continue the Navy Expeditionary Airborne Electronic Attack (AEA) mission and recapitalized the Navy EA-6B expeditionary force with the EA-18G. As a result, 26 additional aircraft were programmed for procurement for three active and one reserve expeditionary squadrons. All three active component expeditionary squadrons have transitioned to the EA-18G. The first EA-18G deployment occurred in November 2010 in an expeditionary role in support of *Operation New Dawn (OND)* and redeployed in March 2011 in support of *Operations Odyssey Dawn and Unified Protector*, where the EA-18G conducted combat operations. The first carrier deployment occurred in May 2011 on board USS George H. W. Bush (CVN 77). As of early 2012, 56 EA-18G aircraft have been delivered with another 22 aircraft scheduled for delivery in fiscal year 2012. An inventory objective of 114 aircraft is planned to support ten carrier based squadrons, three active expeditionary squadrons, and one reserve squadron. Full Operational Capability is planned for FY 2015.

Developers

Boeing	St. Louis, Missouri
Northrop Grumman	Bethpage, New York

EA-6B *Prowler* Airborne Electronic Attack Aircraft

Description

The EA-6B *Prowler* provides Electronic Warfare (EW) capabilities, most notably Airborne Electronic Attack (AEA) and Anti-Radiation Missile (ARM), against enemy systems operating within the radio frequency spectrum. EA-6B capabilities have traditionally enhanced the strike capabilities of carrier air wings and Marine Air Ground Task Force (MAGTF) operations. The need for EW has demonstrably increased during numerous joint and allied operations since 1995 against traditional and non-traditional target sets in support of ground forces. These capabilities continue to be required in Overseas Contingency Operations (OCO) where EA-6B operations in Afghanistan and Iraq protected coalition forces and disrupted critical command and control links. The enormous demand for AEA in *Operation Enduring Freedom (OEF)* and *Operation Iraqi Freedom (OIF)* drove EA-6B employment rates to record levels.

Status

The EA-6B Improved Capability (ICAP) III upgrade reached Initial Operational Capability (IOC) in September 2005. This generational leap in EW capability deployed for the first time in 2006. ICAP III includes a completely redesigned receiver system (ALQ-218), new displays, and MIDS/Link-16, which dramatically improve joint interoperability. The Navy will eventually "sundown" the *Prowler* and transition to an all EA-18G *Growler* force by 2015.

The Marine Corps has transitioned its first ICAP III squadron and will complete its transition to an all ICAP III force by end 2012. The Marines plan to fly the EA-6B through 2019. Its planned replacement is a series of networked payloads forming a system of systems labeled MAGTF EW, which will provide increased capacity scalable to meet the requirements of Marine and joint commanders. The first implementation of MAGTF EW is the Intrepid Tiger II pod carried on AV-8B scheduled for deployment in FY 2012.

Developers

Northrop Grumman Corporation	Bethpage, New York

F-35 Joint Strike Fighter

Description

The JSF F-35 *Lightning II* program will deliver a transformational family of next-generation strike aircraft, combining stealth and enhanced sensors to provide lethal, survivable and supportable tactical jet aviation strike fighters. The Navy Carrier Variant (CV), the Marine Corps Short Takeoff and Vertical Landing (STOVL) and Air Force Conventional Takeoff and Landing (CTOL) "family of aircraft" design share a high level of commonality while meeting U.S. service and allied partner needs. The keystone of this effort is a mission systems avionics suite that delivers unparalleled interoperability among U.S. armed services and coalition partners. Agreements for international participation in System Development and Demonstration (SDD) have been negotiated with Australia, Canada, Denmark, Italy, the Netherlands, Norway, Turkey, and the United Kingdom. A Security Cooperation Partnership (SCP) Letter of Agreement has been signed with Israel while an SCP Memorandum of Understanding (MoU) has been established with Singapore. The STOVL variant will replace Marine F/A-18s and AV-8Bs. The CV will replace F/A-18A-C aircraft and complement the F/A-18E/F.

Status

The JSF is in its 11th year of a planned 15-year SDD program. Following a Nunn-McCurdy breach, OSD certified the JSF as essential to national security. First CTOL variant SDD flight was December 2006; first STOVL flight was June 2008; and first CV flight was June 2010. Initial LHD testing occurred in October 2011 aboard USS Wasp. Initial Electromagnetic Aircraft Launch System (EMALS) testing occurred in November 2011. All key performance parameters will be met at IOC. The DoD Base Realignment and Closure Commission 2005 directed the first JSF Integrated Training Center to be at Eglin Air Force Base, Florida.

Developers

Lockheed Martin	Ft. Worth, Texas
Pratt & Whitney	Hartford, Connecticut

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

Description

The F/A-18 *Hornet* is a multi-mission strike fighter that combines the capabilities of a fighter and an attack aircraft. The single-seat F/A-18A and two-seat F/A-18B became operational in 1983. Eventually, the *Hornet* replaced the Navy's A-6, A-7, and F-4 and the Marine Corps' F-4 aircraft. Reliability and ease of maintenance were emphasized in the *Hornet's* design and F/A-18s have consistently flown three times as many hours without failure as other Navy tactical aircraft, while requiring half the maintenance time.

The F/A-18 is equipped with a digital fly-by-wire flight control system that provides exceptional maneuverability and allows the pilot to concentrate on operating the aircraft's weapons system. A solid thrust-to-weight ratio and superior turn characteristics, combined with energy sustainability, enable the *Hornet* to hold its own against any adversary. The ability to sustain evasive action is what many pilots consider to be the *Hornet's* finest trait. The F/A-18 is the Navy's first tactical jet to incorporate digital-bus architecture for the entire avionics suite, making this component of the aircraft relatively easy to upgrade on a regular and affordable basis.

Following a production run of more than 400 F/A-18A/Bs, deliveries of the single-seat F/A-18C and two-seat F/A-18D began in September 1987. The F/A-18C/D models incorporated upgrades for employing updated missiles and jamming devices. These versions are armed with the AIM-120 AMRAAM and the infrared-imaging version of the AGM-65 Maverick.

The *Hornet* has been battle tested and proved to be a highly reliable and versatile strike fighter. Navy and Marine Corps *Hornets* were in the forefront of strikes in Afghanistan in 2001 during *Operation Enduring Freedom* and continue serving in *Operations Enduring Freedom* and *Iraqi Freedom*. The latest lot of F/A-18C/D *Hornets* is far more capable than the first F/A-18A/Bs. Although the F/A-18C/D's growth is limited, the *Hornet* will continue to fill carrier air wings for years to come, before gradually giving way to the larger, longer-range and more capable F/A-18E/F *Super Hornet* and the F-35 Joint Strike Fighter. The last *Hornet*, an F/A-18D, rolled off the Boeing production line in August 2000.

Status

As of late 2011, the Navy and Marine Corps had 96 F/A-18A, 22 F/A-18B, 375 F/A-18C and 132 F/A-18D aircraft in service and test roles, and two NF/A-18C and two NF/A-18D versions in permanent test roles. *Hornets* equip 25 active Navy and Marine Corps and three Navy and Marine Corps Reserve strike fighter squadrons, three fleet readiness squadrons, three air test and evaluation squadrons, the Navy's Flight Demonstration Squadron (Blue Angels) and the Naval Strike & Air Warfare Center.

Developers

Boeing	St. Louis, Missouri
General Electric	Lynn, Massachusetts

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

Description

The multi-mission F/A-18E/F *Super Hornet* strike fighter is an evolutionary upgrade of the F/A-18C/D *Hornet*. The F/A-18E/F is able to conduct unescorted strikes against highly defended targets early in a conflict. The *Super Hornet* provides the carrier strike group with a strike fighter that has significant growth potential; more than adequate carrier-based landing weight, range, endurance, and ordnance-carrying capabilities comparable to those of the F-14 *Tomcat* and F/A-18A/C *Hornet* it replaces. The single-seat F/A-18E and the two-seat F/A-18F have a 25 percent larger wing area and a 33 percent higher internal fuel capacity that effectively increases endurance by 50 percent and mission range by 41 percent. The *Super Hornet* incorporates two additional wing stations that allow for increased payload flexibility in the mix of air-to-air and air-to-ground ordnance. It has five "wet" stations that give the *Super Hornet* in-flight tanker capability, allowing it to replace the S-3 Viking in the tanking role. The *Super Hornet* is also able to carry a full array of the newest joint "smart" weapons—e.g., the Joint Direct Attack Munition (JDAM) and the Joint Standoff Weapon (JSOW).

The *Super Hornet* has the ability to recover aboard a carrier with optimum reserve fuel while carrying a load of precision-strike weapons. Its carrier-recovery payload is more than 9,000 pounds. The *Super Hornet* also has the space, power, and cooling capability needed to accommodate valuable but installation-sensitive avionics when they become available, including the Active Electronically Scanned-Array (AESA) radar. Compared to the F-14 Tomcat, the *Super Hornet's* cost per flight hour is 40 percent lower and requires 75 percent fewer labor hours per flight hour.

Sophisticated systems—such as the Integrated Defensive Electronic Countermeasures System (IDECMS), Advanced Targeting Forward Looking Infrared (ATFLIR), Joint Helmet-Mounted Cueing System (JHMCS), JDAM and JSOW, AIM-9X missile, SHARP Shared Reconnaissance Pod, APG-79 AESA radar, and advanced mission computers and displays—make the F/A-18E/F an extremely capable and lethal strike platform. Future planned upgrades include Advanced Anti-Radiation Guided Missile (AARGM), Joint Air to Ground Missile (JAGM), and various cockpit and display improvements.

The first operational F/A-18E *Super Hornet* squadron (VFA-115) deployed on board USS Abraham Lincoln (CVN 72) on July 24, 2002, for a 10-month initial deployment that included the openings events of *Operation Iraqi Freedom*. F/A-18E/F *Super Hornets* remain at the forefront of combat operations in Afghanistan. *Super Hornet* squadrons have been integrated into all Navy air wings, and with future capability upgrades, are well suited to complement the arrival of the F-35.

Status

As of October 2011, there were 195 F/A-18E models and 236 F/A-18F models in the U.S. Navy inventory. The F/A-18E/F serves as a replacement for both older model F/A-18 A/C aircraft, as well as for the now retired F-14 Tomcat.

Developers

Boeing	St. Louis, Missouri
General Electric	Lynn, Massachusetts

HH-60H *Seahawk*

Description

The Navy's HH-60H *Seahawk* achieved initial operational capability in 1989, providing combat search and rescue as well as naval special warfare support as an integral element of the carrier air wing. These capable aircraft are being replaced onboard aircraft carriers by the newer MH-60S, but due to significant remaining airframe life, they are being retained in two squadrons, HSC-84 and HSC-85, dedicated to expeditionary special operations forces (SOF) combat support. HH-60H's use Forward Looking Infrared (FLIR) sensors, air-to-ground weapons, and robust communications capabilities to provide critical SOF mobility, fires, and logistics support. They are planned to remain in the naval inventory until 2028.

Status

All 35 HH-60H *Seahawks* are receiving necessary operational and maintenance capability upgrades to retain combat capability while leveraging MH-60 R/S technologies to reduce lifecycle costs.

Developers

Sikorsky Aircraft Corp	Stratford, Connecticut

KC-130J *Hercules* Tactical Tanker and Transport

Description

The KC-130 is a four-engine turbo-prop, multi-role, multi-mission tactical aerial refueler and tactical transport aircraft that supports all six functions of Marine Aviation and is well suited to meet the mission needs of the forward-deployed MAGTF. The *Hercules* provides fixed-wing, rotary-wing, and tilt-rotor tactical air-to-air 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 aero medical evacuation; combat search and rescue support. When equipped with the Harvest HAWK ISR / Weapon Mission kit, the aircraft can perform Multi-Sensor Image Reconnaissance (MIR) and provide Close Air Support (CAS). The KC-130J, with its increase in speed, altitude, range, performance, state-of-the-art flight station (which includes two heads-up displays (HUDs), night vision lighting, an augmented crew station, and fully-integrated digital avionics), enhanced air-to-air refueling capability, and aircraft survivability enhancements provides the MAGTF commander with multi-mission capabilities well into the 21st Century.

Status

The USMC requirement is for 79 KC-130Js. The legacy fleet of 51 KC-130F and R model aircraft was retired by February 2009, and

28 KC-130T model aircraft are yet to be replaced. As of December 2011, the USMC KC-130J inventory totaled 46 KC-130Js.

Developers
Lockheed Martin — Marietta, Georgia

MH-53E *Sea Dragon*

Description
The MH-53E provides Airborne Mine Countermeasure (AMCM) capability to naval forces, and, as its primary mission, directly supports Sea Shield. Through various mine hunting and mine sweeping systems, the MH-53E supports undersea warfare by defending the fleet from surface and sub-surface mine threats and ensuring sea lines of communication remain passable for not only carrier and expeditionary strike groups, but also for vital commercial shipping. The MH-53E provides the Navy's only heavy-lift rotary-wing capability enabling over the horizon combat logistics support. Secondary missions include Vertical Onboard Delivery (VOD), Combat Logistics, Humanitarian Assistance and Disaster Relief (HA/DR), and Naval Special Warfare mission areas. This multi-mission capability of the MH-53E additionally supports the Navy's Six Core Capabilities articulated in the Cooperative Strategy.

Status
The MH-53E program is executing an in-service sustainment strategy to ensure successful transition to the MH-60S Organic AMCM capability and continue to provide enduring heavy lift capability to the sea base. The sustainment strategy addresses fatigue, obsolescence, readiness, and safety issues. A Fatigue Life Extension (FLEX) program is in progress, which will increase the aircraft service life to 10,000 hours and enable the Navy to maintain an AMCM capability until the OAMCM transition is complete in the 2025 timeframe.

Developers
Sikorsky Aircraft — Stratford, Connecticut

MH-60 R/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 (CONOPS) for the 21st Century. The complementary capabilities of these two helicopters are ideally suited to "Hunter-Killer" teams, leveraging MH-60R sensors and MH-60S weapons systems to neutralize an array of surface and subsurface threats rapidly. As the Helicopter CONOPS unfolds, *Seahawks* are deploying in companion squadrons as part of carrier air wings embarked in the Navy's aircraft carriers, surface warships, and logistics ships.

Additionally, the aircraft are embarked in expeditionary squadrons to support Expeditionary Strike Groups, independent deployments, and shore based operations. The MH-60R provides surface and anti-submarine warfare capability with a suite of sen-

sors and weapons that include a dipping sonar, electronic support measures, advanced Forward Looking Infrared, precision air-to-surface missiles, and torpedoes. The MH-60S provides surface and mine countermeasure warfare capability, as well as robust Naval Special Warfare, Search and Rescue, Combat Search and Rescue, and logistics capability, with air-to-ground weapons and the same FLIR and Link16 capability as the MH-60R. Airborne mine countermeasure operations will be accomplished using advanced sensor and weapons packages to provide detection, localization, and neutralization of these anti-access threats. MH-60R/S platforms are produced with 85 percent common components (e.g., common cockpit and dynamic components) to simplify maintenance, logistics, and training.

Status

The MH-60R completed its Operational Evaluation in the third quarter FY 2005. It was authorized to enter Full Rate Production in March 2006. The MH-60S was approved for full-rate production in August 2002 and is undergoing scheduled block upgrades for Armed Helicopter and AMCM missions.

Developers

Lockheed Martin	Oswego, New York
Sikorsky	Stratford, Connecticut

MV-22 *Osprey*

Description

The MV-22 *Osprey* is a tilt-rotor—the only such operational military aircraft in the world—Vertical/Short Take-Off and Landing (V/STOL) aircraft designed as the medium-lift replacement for the CH-46E helicopter. 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 12,500-pound dual-hook or 10,000-pound single-hook external load, and has a strategic self-deployment capability of 2,100 nautical miles with a single aerial refueling. The MV-22 flight capabilities are far superior to the CH-46E it replaces: twice the speed, three times the payload, and six times the range. The MV-22 represents a revolutionary change in aircraft capability to meet a plethora of expeditionary and unique missions for the 21st Century. A Special Operation Forces (SOF) variant, the CV-22, is being procured by the Air Force and SOCOM.

Status

MS III complete and the MV-22 is approved for Full Rate Production; the aircraft entered a congressionally approved joint five-year MYP in FY 2008. IOC was declared for the MV-22 in June 2007. As of early 2012, six East Coast VMM squadrons have successfully stood up and completed combat tours in Iraq, Afghanistan, and on shipboard expeditionary deployments. Five MV-22 squadrons have stood up on the West Coast with their first deployments scheduled in FY 2012. CV-22 IOC occurred in FY 2009.

Developers

Bell Helicopter Textron	Fort Worth, Texas
Boeing Defense and Space Group, Helicopter Division	Philadelphia, Pennsylvania
Rolls Royce	Indianapolis, Indiana

Numerous major suppliers, to include Raytheon, Moog, Sundstrand, General Dynamics, Honeywell, Northrop Grumman, Vought, Smiths, EFW, and BAE.

Naval Aviation Training Aircraft

Description

Commander, Naval Air Training Command's (CNATRA) mission is to safely train and produce the world's finest combat-quality aviation professionals—Aviators and Military Flight Officers––and deliver them at the right time, in the right numbers, and at the right cost to the Fleet for follow-on tasking in operations. This mission is key to affordable fleet readiness. CNATRA's training aircraft inventory includes the T-34 Turbo Mentor, T-6 Texan II, T-45 Goshawk, TH-57 Sea Ranger, T-44 Pegasus, TC-12 Huron, and the T-39 Sabreliner.

The first aircraft that all aspiring future USN/USMC pilots and flight officers fly are the T-34C Turbo Mentor or the T-6B Texan II (pilots) and the T-6A Texan II (flight officers). The T-34 began its Navy career in 1977 and has successfully completed its service at NAS Pensacola where it was the primary training aircraft for the Undergraduate Military Flight Officer (UMFO) syllabus. All primary UMFO training is now conducted in the T-6A. The Joint Primary Aircraft Training System (JPATS) comprises the T-6, flight simulators, computer-aided academics, and a Training Integration Management System (TIMS). The aircraft, built by Hawker Beechcraft Corporation, is a derivative of the Swiss Pilatus PC-9 aircraft and features a Pratt & Whitney PT-6A-68 engine, a digital cockpit, ejection seats, and cockpit pressurization and onboard oxygen-generating systems. The T-34C continues to be used for primary pilot training at NAS Whiting Field and at NAS Corpus Christi, but will be replaced by the T-6B. The transition to the T-6B began in April 2010 at NAS Whiting Field, and is scheduled to conclude in FY 2013 at NAS Corpus Christi.

The T-45 Goshawk, the Navy version of the British Aerospace Hawk aircraft, is used for intermediate and advanced training in the strike (jet) pilot and UMFO syllabi. Upgrades to the T-45 include the conversion from analog (T-45A) to digital cockpits (T-45C), resolving an engine-surge issue to enhance fuel efficiency and safety, and preservation of current aircraft through Service Life Assessment and Service Life Extension Programs.

The TH-57 Sea Ranger, the Navy version of the commercial Bell Jet Ranger, is used for advanced training in the rotary-wing pilot syllabus. The TH-57B (visual flight), the TH-57C (instrument flight), and associated simulators will be converted from analog to digital cockpits (TH-57D), guaranteeing aircraft availability and relevance through 2030.

The T-44 Pegasus and the TC-12 Huron are both twin turboprop, pressurized, fixed-wing aircraft that are used for intermediate and advanced training in the multi-engine and tilt-rotor pilot syllabi. Future improvements to the T-44 include the replacement of wing wiring, simulator upgrades, and the conversion from analog to digital cockpits (T-44C).

The T-39 Sabreliner is a multi-purpose low-wing, twin-turbojet aircraft that has been in naval service since the early 1990s. The T-39 is used for intermediate and advanced training in the strike/strike-fighter UMFO syllabi. The T-45 is being used for the tactical maneuvering portion of strike/strike-fighter UMFO syllabus and will replace the T-39 as the advanced phase radar trainer in FY 2013 with the integration of the Virtual Mission Training System (VMTS), an embedded synthetic radar-training system.

CNATRA has charted a course to revolutionize UMFO training by employing the T-6, the T-45C with VMTS, and high-fidelity simulators to train future UMFOs. This new training program will capitalize on cutting-edge technologies while allowing the Navy to divest of the aging T-39 platform. The new training syllabus is planned to achieve Initial Operating Capability at NAS Pensacola in FY 2013.

Status

The T-6 is in production with a planned inventory objective of 295 aircraft, with the last aircraft to be procured in FY 2014. The Navy took final delivery of its T-45C in October 2009.

Developers

Hawker Beechcraft (T-6)	Wichita, Kansas
Boeing (T-45)	St. Louis, Missouri
	Waco, Texas

P-3C *Orion* Modification, Improvement, and Sustainment

Description

A key enabler to the tri-Service Cooperative Strategy, the legacy P-3C *Orion* provides Anti-Submarine Warfare (ASW), Anti-Surface Warfare (ASUW), and Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) capabilities to naval and joint commanders and contributes directly to maritime domain awareness across the globe in support of carrier and expeditionary strike groups. Squadrons are based in Jacksonville, Florida, Whidbey Island, Washington, and Kaneohe Bay, Hawaii.

An airframe in very high demand, the Navy's P-3 roadmap focuses on three areas: airframe sustainment; mission systems sustainment; and re-capitalization by the Multimission Maritime Aircraft P-8A *Poseidon* to provide a force optimized for regional and littoral crisis and conflict. Specific program elements include:

Airframe Sustainment: In 2003 a Service Life Assessment Program (SLAP) was completed to determine what actions must be taken to extend the P-3C airframe service life safely. Based on SLAP data,

the Navy determined that all P-3s required varying degrees of fatigue inspections and/or repairs at periodic intervals throughout their service lives. Initially a three-tiered approach was undertaken to address fatigue-critical areas that included Special Structural Inspections (SSI), Enhanced Special Structural Inspections (ESSI), and Special Structural Inspection Kits (SSI-K), implemented with the objective of minimizing investment requirements to enable sustainment of the P-3C fleet safely until the P-8A IOC/FOC. SSIs provided fatigue inspections and subsequent repairs necessary to ensure safety of flight until more comprehensive maintenance could be performed. ESSI (FY 2003-2006) and the follow-on SSI-K (FY 2005-to-2012) program of record, provides pre-emptive modification and replacement of critical airframe structural components to enable the airframe to reach its designed service life. In December 2007, 39 aircraft were grounded as a result of on-going Fatigue Life Management Program (FLMP) analysis that revealed the aft lower surface of the outer-wing (Zone 5) experienced fatigue at higher levels than previously estimated. Subsequently, the CNO approved a P-3 Recovery Plan, which included a dual-path approach to modify the outer-wings structurally, in order to return grounded aircraft back to the Fleet. The dual-path approach encompassed targeted Zone 5 modifications, which included limited replacement of outer-wing components, as well as the manufacturing and installation of new outer-wing assemblies. Although P-3C fatigue and material condition continues to be evaluated via FLMP and remains a persistent risk, inspection, repair, and modification efforts remain essential to sustaining the P-3C fleet until the P-8A starts replacing the P-3C in 2013.

Mission Systems Sustainment: The Mission System Sustainment program is designed to improve aircraft availability through replacement and upgrades of obsolete systems with modern and more reliable hardware systems and software. These programs ensure the P-3C continues to meet Navy's Anti-Submarine Warfare, Anti-Surface Warfare, Over the Horizon Targeting and C4ISR requirements, while also reducing risk in mission system migration/integration for the P-8A Poseidon.

Recapitalization: P-8A *Poseidon* recapitalizes the Maritime Patrol Anti-Submarine Warfare (ASW), Anti-Surface Warfare (ASUW) and armed Intelligence, Surveillance and Reconnaissance (ISR) capability that currently resides in P-3 squadrons. The P-8A Poseidon will start to fill the P-3C capability in 2013.

Status

With more than 100 aircraft having been periodically grounded for fatigue since 2005, P-3 sustainment and modernization programs remain critical to ensure successful transition to the P-8A *Poseidon*. Continued groundings are expected during semiannual updates to individual airframe fatigue analysis. Through CY 2011, 87 SSIs were completed (inspection and repair efforts finished), 39 ESSIs were completed (inspection and repair efforts finished), 38 SSI-Ks were completed with 15 aircraft and 15 rotable wingsets in work and 49 Zone 5 modifications have been completed with 19 aircraft and 15 rotable wingsets in work. Procurement of outer

wing assemblies began in 2008 with installs commencing in 2011; 13 aircraft are in work (up to 29 are planned) in early 2012.

Developers

Lockheed Martin	Marietta, Georgia
	Eagan, Minnesota
	Greenville, South Carolina
	Manassas, Virginia
L-3 Communications	Greenville, Texas
	Waco, Texas

P-8A *Poseidon* Multi-mission Maritime Aircraft (MMA)

Description

The P-8A *Poseidon* will replace the P-3C Orion, which has reached the end of its service life. The P-8A will provide Navy unique broad-area, persistent anti-submarine warfare cueing-to-killing capability as well as significant anti-surface warfare and intelligence, surveillance, and reconnaissance (ISR) capability. The P-8A will feature a technologically agile open architecture that enables integration of modern, capable sensors, a robust communications suite, ASW and ASUW weapons and acoustic/non-acoustic sensors. P-8A 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 as well as the Force Application, Command and Control, and Battlespace Awareness Joint Capability Areas. P-8A will leverage global logistics support infrastructure and established advanced training applications to provide both higher availability and improved warfighting readiness.

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 (AoA) began in 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 armed ISR, and that UAVs provided a transformational opportunity for obtaining additional capability for warfighters. In 2002, the Navy re-engaged industry in Component Advanced Development, refining concepts, matching architecture to fill the Navy vision and validating requirements. USD (AT&L) approved a revised acquisition strategy to focus MMA on P-3 replacement and not a P-3 Service Life Extension. The Operational Requirements Document/Capability Development Document was endorsed by the Navy staff and received the required certifications from the Joint staff in preparation for a 2004 Milestone B (entry into System Development and Demonstration). That milestone was successfully passed in May 2004, and in June 2004 the Navy selected the McDonnell-Douglas Corporation, a wholly owned subsidiary of the Boeing Company, as the single system integrator. P-8A completed Preliminary Design Review in November 2005, Critical Design Review in June 2007, and Design Readiness Review in August 2007. The program successfully passed Milestone C on August 27, 2010 and received

permission from USD AT&L to buy three Low Rate Initial Production lots totaling 24 aircraft. The first lot of six P-8As will be delivered in FY 2012 to support an Initial Operational Capability in 2013.

Developers
The Boeing Company Renton, Washington

VXX Presidential Replacement Helicopter

Description
A replacement is under review for the 36-year-old VH-3D and 22-year-old VH-60N helicopters that provide transportation for the President of the United States, foreign heads of state, and other dignitaries as directed by the White House Military Office. The Replacement Presidential Helicopter (VXX) will provide a hardened, mobile command-and-control transportation capability and a system-of-integrated-systems necessary to meet current and future presidential transport mission requirements.

Status
The VXX program is in the Material Solution Analysis phase. An Initial Capabilities Document was approved by the JROC in June 2009, and the program received a Material Development Decision on June 7, 2010. An Analysis of Alternatives is currently being updated and risk reduction activities are ongoing in order to posture the program for success.

Developers
To be determined.

AVIATION WEAPONS

AAGM-88E Advanced Anti-Radiation Guided Missile (AARGM)

Description
The Navy's AGM-88E AARGM is the latest evolution of the High-Speed Anti-Radiation Mission (HARM) weapon system. HARM is the Navy's only anti-radiation, defense-suppression, air-to-surface missile. Employed successfully in naval operations for decades, HARM can destroy or suppress broadcasting enemy electronic emitters, especially those associated with radar sites used to direct anti-aircraft guns and surface-to-air missiles. AGM-88B (Block IIIA) and AGM-88C (Block V) are the fielded fleet configurations of HARM. The legacy HARM program was a joint-service program with the Navy as lead service.

The AGM-88E project upgrades a portion of existing HARM missile inventory with a new guidance section incorporating multi-sensor, multi-spectral digital anti-radiation homing detection capability, Global Positioning System/Inertial Navigation System (GPS/INS) guidance, and a millimeter-wave terminal seeker. AARGM also includes a netted situation awareness/targeting capability and weapon impact assessment reporting via direct con-

nectivity with national technical means. The U.S. DoD and the Ministry of Defense of the Republic of Italy have signed an international MoA for cooperative development of AGM-88E. The AARGM system will provide the U.S. Navy/Marine Corps and the Italian Air Force with a transformational and affordable upgrade to the legacy HARM.

Status
The AGM-88E is an ACAT-IC SDD program with a planned IOC in 2012. The AARGM inventory objective is 1,750 tactical rounds for integration on F/A-18C/D/E/F, EA-18G, and Joint Strike Fighter (JSF) aircraft. The Italian Air Force will integrate AARGM on their Tornado ECR aircraft. AARGM is undergoing IOT&E, which is to be completed in the second quarter FY 2012.

Developers
ATK Woodland Hills, California

AGM-154 Joint Standoff Weapon (JSOW)

Description
JSOW is a family of weapons that permits naval aircraft to attack targets at increased standoff distances. The weapons use GPS and INS for guidance. All JSOW variants share a common body, but can be configured for use against area targets or bunker penetration. The JSOW Unitary (JSOW-C) variant adds an Imaging Infrared Seeker and Autonomous Target Acquisition (ATA) to attack point targets with precision accuracy. The JSOW-C-1 will incorporate new target tracking algorithms into the seeker for moving targets, giving the joint force commanders an affordable, air delivered, standoff weapon that is effective against fixed and re-locatable land targets as well as maritime targets. Used in conjunction with accurate targeting information and anti-radiation weapons, JSOW-C-1 will destroy enemy air defenses creating sanctuaries that permit the rapid transition to low cost, direct-attack ordnance.

Status
AGM-154A reached IOC in 1999, and the AGM-154C variant achieved IOC in FY 2005. Procurement JSOW C-1 began in FY 2011. JSOW C-1 is planned to be procured until 2020.

Developers
Raytheon Tucson, Arizona

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

Description
AIM-120 AMRAAM is an all-weather, all-environment radar-guided missile developed by the Air Force and Navy. The missile is currently 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. Entering the fleet in September 1993, AMRAAM has evolved to maintain air superiority through Pre-Planned Product Improvement (P3I) programs. This modernization plan includes clipped wings for internal carriage, a pro-

pulsion enhancement program, increased warhead lethality, and enhanced electronic counter-countermeasures (ECCM) capabilities through hardware and software upgrades. Most importantly to the warfighter, the missile has improved capabilities against low- and high-altitude targets in an advancing threat environment. AIM-120C7 completed production in FY 2008 as AIM-120D production began. AMRAAM is expected to be the sole Medium/Beyond Visual Range (M/BVR) missile with the "sundown" of the AIM-7 Sparrow by the end of the future years defense program. The Department of the Navy is investigating follow-on options for BVR missile capabilities to match the NAV2031 threat requirements.

Status
The AIM-120C7 missile variant is a product of P3I and it reached IOC in FY 2008. AIM-120D IOC is scheduled for FY 2014.

Developers
Raytheon Tucson, Arizona

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

Description
The AIM-9X is the latest in the Sidewinder series. It is a fifth-generation IR launch and leave missile with superior detection and tracking capability, high off-bore sight capability, robust IR Counter-Countermeasures (IRCCM), enhanced maneuverability, and growth potential via software improvements. The AIM-9X development leveraged upon existing AIM-9M components to minimize development risk and cost. AIM-9X achieved Initial Operational Capability (IOC) in FY 2004 and is currently in production for both the U.S. and FMS customers. Various independent obsolescence and Preplanned Product Improvements (P3I) efforts have been ongoing since IOC. A series of independent Engineering Change Proposals (ECPs) provided improved performance in terms of faster processors in the guidance control unit, an improved fuze/target detector (DSU-41), and smaller components freeing up space within the missile. Exploiting these improvements and additional space as part of an integrated solution provided an opportunity to increase the AIM-9X capability beyond what is currently fielded. The warfighters have documented these requirements in the AIM-9X Block II Capability Production Document (CPD) via a Milestone C decision in FY 2011 to meet these new requirements.

Status
More than 900 AIM-9X Block I all up rounds (AUR) and 350 Block I captive air training missiles (CATM) have been delivered to the Department of the Navy. The AIM-9X Block II is in developmental test.

Developers
Raytheon Tucson, Arizona

Airborne Mine Neutralization System (AMNS)

Description

The AMNS is an expendable, remotely operated mine neutralization device that leverages non-developmental integration and commercial-off-the-shelf technologies. Deployed from MH-60S helicopters, it provides identification and neutralization of proud (i.e., not buried) and in-volume naval mines. AMNS devices are intended for use in previously detected mine locations, where it will reacquire and neutralize identified targets.

Status

Beginning in FY 2003, legacy AMNS (AN/ASQ-232) systems were procured for the MH-53E to provide a near-term contingency airborne neutralization capability. Follow-on AMNS (AN/ASQ-235) system integration work for the MH-60S began in FY 2003 and will continue through a projected FY 2014 IOC for the AMNS on the MH-60S and integrated aboard the LCS shipbuilding program.

Developers

Raytheon	Portsmouth, Rhode Island
BAE Systems	London, England

GBU-10/12/16/24 LGB/DMLGB/DAMTC Laser-Guided Bomb/Dual Mode LGB and Direct-Attack Moving Target Capability (DAMTC)

Description

The LGB program is a Navy and Air Force joint effort, with the latter acting as the lead and executive service for procurement. LGBs include GBU-10, -12, and -16 that use MK-80/BLU series General Purpose (GP) bomb bodies, and GBU-24 that uses the BLU-109 bomb body incorporating state-of-the-art guidance and control features. GBU-12 is a 500-pound class weapon; GBU-16 is a 1,000-pound class weapon; and GBU-10 is a 2,000-pound class weapon. An LGB has a MK-80/BLU-series warhead fitted with a laser-guidance kit and Computer Control Group (CCG) mounted on the bomb nose. An electronic fuse housed in the aft section of the bomb body initiates the warhead. The seeker, housed in the CCG, senses laser energy and sends signals to the CCG canards to guide the weapon to the spot of reflected energy. Laser energy can be applied to the target by ground or airborne designators, or self-designated by laser-configured aircraft. LGBs will remain in the inventory until at least 2020.

The DMLGB is a retrofit to the legacy LGBs in the Navy's inventory, converting them to the dual-mode configuration using common components. It provides increased flexibility to the warfighter by combining the proven technology of laser terminal guidance with all-weather fire-and-forget capability of Inertial Navigation System/Global Positioning System (INS/GPS). The retrofit involves replacing the existing Computer Control Group (CCG) system with an INS/GPS to provide legacy LGBs with an all-weather guidance system. By using a retrofit strategy vice developing a new weapon, we can streamline the qualification timelines and

will put a new weapon capability in the warfighter's hands faster. The DMLGB reached IOC in September 2007 on both the AV-8B and F/A-18 with planned future integration on the F-35.

In September 2006, Commander, Central Command (CENTCOM) released an Urgent Operational Need (UON) request to address the capability gap against ground moving targets. The Department of the Navy and the Department of the Air Force released a Rapid Deployment Capability (RDC) and Quick Reaction Capability (QRC), respectively, to provide a low-cost, non-developmental enhancement to GBU-38 to address the moving target capability gap quickly. Open competition of source selection was completed in February 2010 with the Milestone C decision. Boeing was awarded the contract to produce their version of the Laser Joint Direct Attack Missile (LJDAM), which provides a Direct-Attack Moving Target Capability (DAMTC). LJDAM (GBU-54) is a 500-lb dual-mode weapon (GPS/INS of a JDAM and Laser tracker of a LGB) which couples Aim Point Prediction (APP) with proportional navigation to engage high speed moving and maneuvering targets. LJDAM provides added capability and an extra degree of flexibility to the Fleet's existing inventory of PGMs to satisfy the ground moving target capability gap.

Dual-mode LGBs offer the flexibility to attack fixed targets precisely in all-weather conditions as well as the ability to attack "pop-up" targets of opportunity. However, LGBs were designed to attack fixed, not moving targets, and herein lays the capability gap. Joint Forces fixed-wing aircraft have few level-of-effort options for attacking moving targets for Close Air Support scenarios and other fires in support of maneuver operations. DAMTC adds a clear-weather capability against moving targets by adding enhancements to existing inventory of PGMs. The intent of DAMTC is to provide a limited near-term capability gap-filler against moving targets as other weapons are in development. SDB II and JAGM will provide the Joint Forces the ability to engage moving targets at standoff ranges, and are scheduled to become operational after 2015.

Status

Approximately 7,000 DMLGB Kits have been procured and approximately 6,700 LJDAM Kits will be procured through the life of the program. LJDAM (DAMTC) will reach IOC in the second quarter FY 2012 with the delivery of the first 700 kits.

Developers

Raytheon	Tucson, Arizona
Lockheed Martin	Bethesda, Maryland

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

Description

The JDAM is a multi-service program, with Air Force as lead, for a Global Positioning System (GPS)-aided, Inertial Navigation System (INS) guidance kit to improve the accuracy of existing 500-pound, 1,000-pound, and 2,000-pound general-purpose and penetrator bombs (BLU-109) in all weather conditions. JDAMs address a broad spectrum of fixed and re-locatable targets at ranges of 15 nautical miles from 40,000 feet. The weapon is autonomous, all weather, and able to be re-targeted by the pilot prior to release. JDAM with GPS has an accuracy of less than 13 meters Circular Error Probable (CEP). JDAM is a true force multiplier, allowing a single aircraft to attack multiple targets from a single release point. JDAM has proven its value many times over during operations in Iraq, Kosovo, and Afghanistan.

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 occurred during the second quarter of FY 2005.

Developers

Boeing — St. Louis, Missouri

AVIATION SENSORS

Airborne Laser Mine Detection System (ALMDS)

Description

The ALMDS is a 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 MCM 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, operating areas, 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 in-service inventory.

Status

A competitive contract was awarded in April 2000 for development of an integrated ALMDS system for the MH-60S. Milestone C and LRIP I occurred in FY 2005. The IOC is scheduled for FY 2014.

Developers

Northrop Grumman — Melbourne, Florida
Arete Associates — Tucson, Arizona

ALR-67(V)3 Advanced Special Receiver

Description

The ALR-67(V)3 is a Radar Warning Receiver (RWR) designed to meet Navy requirements through the year 2020. It enables the Navy F/A-18 family of aircraft to detect threat radar emissions, enhancing aircrew situational awareness and aircraft survivability.

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-18 aircraft.

Developers

Raytheon — Goleta, California

APG-79 Active Electronically Scanned Array (AESA) Radar System

Description

The APG-79 AESA Phase I upgrade provides multi-mode function flexibility while enhancing performance in the air-to-air arena (including cruise missile defense) as well as the air-to-ground arena. The Phase II upgrade provides enhanced performance in hostile electronic countermeasures environments and provides significant electronic warfare improvements enabling the targeting of hostile emitters. Growth provisions will allow for future reconnaissance capability through the use of synthetic aperture radar technology and improved hardware and software. The APG-79 AESA radar is installed on block II F/A-18E/F and all EA-18G aircraft.

Status

The APG-79 completed subcontractor competition in November 1999, the Engineering and Manufacturing Development contract was awarded in February 2001, and the radar achieved Initial Operational Capability in 2007. Planned APG-79 AESA procurement is 537 systems: 404 forward fit and 133 retrofit. AESA Milestone C and LRIP II approvals were received in January 2004 for initial delivery with Lot 27 *Super Hornets* in FY 2005. Full Rate Production was achieved in June 2007, following completion of the Initial Operational Test and Evaluation in December 2006. The first deployment of the AESA system was with VFA-22 in 2008. Retrofit installs into Lot 26-29 F/A-18E/Fs commenced in 2011.

Developers

Boeing — St. Louis, Missouri
Raytheon — El Segundo, California

ASQ-228 Advanced Targeting Forward-Looking Infra-Red (ATFLIR)

Description

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

Status

ATFLIR completed Phase I Operational Test and Evaluation in September 2003 and was determined to be operationally suitable and effective and was recommended for further fleet introduction. ATFLIR achieved IOC in September 2003 and has demonstrated its combat capability in support of Operations Iraqi Freedom and Enduring Freedom. Additional improvements are planned to continue through 2012.

Developers

Boeing	St. Louis, Missouri
Raytheon	El Segundo, California

Organic Airborne and Surface Influence Sweep (OASIS)

Description

The OASIS system will provide the Littoral Combat Ship (LCS) with a high-speed, airborne, magnetic/acoustic influence minesweeping capability to neutralize sea mine threats effectively in operating areas where mine hunting is not possible due to mine burial or high bottom clutter. The OASIS system is one of four Airborne Mine Countermeasures (AMCM) systems under development that will be deployed and operated from the MH-60S helicopter.

Status

Milestone C and LRIP I completed in FY 2008. System re-design completed in FY 2009. IOC is to be determined.

Developers

ITT	Panama City, Florida

AVIATION EQUIPMENT AND SYSTEMS

Department of the Navy Large Aircraft Infrared Countermeasures (DoN LAIRCM)

Description

The AN/AAQ-24(V) 25, DoN LAIRCM System combines advanced, two-color Infrared (IR) Missile Warning and Directed Laser Countermeasures to defeat shoulder-launched missiles. The system is being deployed on Marine Corps CH-53E and CH-46E assault helicopters to meet the USMC urgent need for a "…state-of-the-art, reliable, carrier-based and land-based MWS and IR Countermeasure."

The DoN LAIRCM system consists of five major components: five IR MWS sensors; a dedicated processor; a Control Indicator Unit (CIU) for cockpit display; and two Guardian Laser Tracker Assemblies (GLTA) consisting of a four-axis stabilized gimbaled system, a Fine Track Sensor (FTS), and a ViperTM laser.

NAVAIR will begin DoN LAIRCM integration on USN C-40 and USMC KC-130J platforms in FY 2012. The program will complete the Advanced Threat Warning (ATW) upgrade in FY 2013, which increases MWS performance, and add Laser Warning and Hostile Fire Warning to address high priority threats and enhance overall survivability. The DoN LAIRCM Program Office works closely with the USAF to leverage contracts, test and evaluation and sustainment efforts.

Status

DoN LAIRCM IOC was achieved in May 2009 and a Full Rate Production (FRP) decision was approved in January 2010. The program is currently in FRP. Advanced Threat Warning OT&E and deployment is planned in FY 2013.

Developers

Northrop Grumman — Rolling Meadows, Illinois

Integrated Defensive Electronic Counter-Measures (IDECM)

Description

The IDECM system is used to defend the host aircraft against radar-guided surface-to-air missile (SAM) systems and air-to-air missile systems. Through either a towed decoy or several onboard transmitters, the ALQ-214 produces complex waveform radar jamming that defeats advanced SAM systems. Employed on the FA-18E/F, IDECM has been developed in three phases:

IDECM Blk 1: ALQ-165 On Board Jammer and ALE-50 towed decoy (IOC FY 2002)

IDECM Blk 2: ALQ-214 On Board Jammer and ALE-50 towed decoy (IOC FY 2005)

IDECM Blk 3: ALQ-214 On Board Jammer and ALE-55 Fiber Optic Towed Decoy (IOC FY 2009)

The ALQ-214 On Board Jammer portion of this system is intended for F/A-18A+C/D aircraft as well.

Status
The ALQ-214 and ALE-50 (towed decoy) combination is in full-rate production, and the ALE-55 Fiber Optic Towed Decoy entered Full Rate Production in July 2011.

Developers

BAE Systems	Nashua, New Hampshire
ITT	Clifton, New Jersey

Joint and Allied Threat Awareness System (JATAS)

Description
JATAS is an advanced missile warning system that is designed to replace the legacy AN/AAR-47(V) Missile Warning System and increase the survivability of Marine Corps and Navy tilt-rotor and rotary-wing aircraft against IR threats. The system will also provide aircrew with warnings of laser-enabled weapon systems such as range finders, illuminators, and beam riders. The JATAS will interface with the existing AN/ALE-47 Countermeasures Dispensing System, the existing AN/APR-39 Radar Warning Receiver, the existing DoN Large Aircraft Infrared Countermeasure (LAIRCM) system, and other compatible Directed Infrared Countermeasures (DIRCM) systems as part of an integrated electronic countermeasures response to attacking infrared missiles. Additionally, the JATAS will be upgradeable to provide Hostile Fire Indication (HFI) of small arms, rockets, and other unguided threats.

JATAS will be deployed on the MV-22B (lead platform), AH-1Z, UH-1Y, and MH-60R/S. Per the January 2011 JROC-approved JATAS CDD and ASN(RDA) approved JATAS Acquisition Strategy, JATAS will be developed in two increments. Increment I, Phase I includes the missile warning and laser warning capabilities. Increment I, Phase II will add HFI capability against Type I and III threats during engineering and manufacturing development, if technology maturity permits. Increment II, when future technology advancements and funding permit, will develop HFI capability against Type II threats.

Status
JATAS completed a 16-month competitive prototyping technology development (TD) phase in January 2011. A process to select a single JATAS contractor for EMD via a full and open competition commenced in February 2011. JATAS cleared its Milestone B decision in June 2011, and the Navy awarded the EMD contract to ATK in July 2011. JATAS is in EMD phase with IOC scheduled for FY 2015 on the MV-22B.

Developers

ATK	Clearwater, Florida

Joint Mission Planning Systems (JMPS)

Description

The Joint Mission Planning System (JMPS) suite of applications —the core of the Naval Mission Planning Systems (NavMPS) portfolio—is used to plan and load mission data into an aircraft's weapons and avionics systems. JMPS allows squadron aircrew to perform tactical mission planning at the Secret level for a variety of aviation platforms and air-launched weapons. JMPS incorporates legacy Navy Portable Flight Planning Software (N-PFPS) and other platform-specific mission planning capabilities to bring all "stovepiped" legacy DoD mission planning systems under one program and a common JMPS framework. For most USN/USMC platforms, JMPS is the sole interface to load mission critical data into the aircraft.

Status

JMPS, designated the single-mission planning system for naval aviation, is fielded to all F/A-18 variants (including EA-18G), E-2C, EA-6B, AV-8B, MV-22B, all Marine and Navy helicopters, as well as naval aviation training aircraft. JMPS, a post-Milestone C ACAT IVT program, replaced legacy Tactical Automated Mission Planning System (TAMPS) in FY 2006. TAMPS was retired in FY 2007 and N-PFPS users will complete their transition to JMPS in FY 2012. A USN/USAF co-development effort is transitioning JMPS from a Windows XP-based framework to a Windows 7-based framework.

Developers

BAE Systems — Rancho Bernardo, California

Joint Precision Approach and Landing System (JPALS)

Description

JPALS is a joint DoD effort with the Air Force and Army. The Navy assumed the lead service role in March 2007. JPALS fulfills the need for a rapidly deployable, adverse weather, adverse terrain, day-night, survivable, DoD/civil/internationally interoperable, and mobile Precision Approach and Landing capability that can support forward presence, crisis response, and mobility. Sea-based JPALS consists of a GPS-INS based precision landing system component (Shipboard Relative GPS) with a Low Probability of Intercept (LPI) two-way data-link and an independent backup system. JPALS provides critical enabling technology for several naval programs such as CVN 78-class aircraft carriers, JSF, N-UCAS, and DDG 1000. Sea-based JPALS will also be installed on all air-capable surface ships, most carrier air wing aircraft (F/A-18E/F, E/A-18G, E-2C/D, C-2A, and MH-60 R/S), and all DoD aircraft capable of operating from Navy ships. Except for the system designated as the SRGPS backup, JPALS will replace the Automat-

ic Carrier Landing System (ACLS) on aircraft carriers, SPN-35 on LH-class amphibious ships, and various approach systems ashore, including Instrument Landing Systems (ILS), TACAN, and fixed and mobile Precision Approach Radar (PAR). JPALS will also be civil interoperable and FAA certifiable.

Status

JPALS completed MS B in June 2008 with contract award on September 15, 2008. Sea-based JPALS IOC is 2014. The system is on schedule for installation in CVN 78, the lead ship of the CVN 21 program new design aircraft carrier.

Developers

Raytheon Fullerton, California

Partnering developers include Rockwell Collins, Northrop Grumman, SAIC.

Military Flight Operations Quality Assurance (MFOQA)

Description

MFOQA is knowledge-management software using data collected during flight to conduct post-flight analysis of aircrew and aircraft systems performance. MFOQA requires no additional equipment to be mounted on the aircraft platform and no additional tasking is added to the aircrew during flight. After each flight event, aircrew can remove the data-collection card, take it to the squadron ready room, and load in the data to squadron computers. Applying MFOQA software already loaded in the computer, the aircrew can replay the flight in animation, noting geographic position, instrument readings, and aircraft performance parameters. In addition, maintenance personnel can perform diagnostic analysis of the aircraft systems, aircrews can self-evaluate their performance, and squadron leadership can review and counsel on flight procedures and safety and training issues. The ultimate payoff will be increased readiness through improved safety, better training, and faster maintenance troubleshooting. Data from each flight are aggregated for trend analysis at upper tiers of command at the group, wing, and type command levels. Flight operations quality assurance has been used in the commercial aviation industry for decades. Surveys from the airline industry have yielded high praise for the process and its benefits to Maintenance, Operations, Safety, and Training (MOST).

Status

MFOQA completed MS B in the first quarter of 2007 and is scheduled for MS C in the first quarter FY 2013, with IOC to follow shortly thereafter. The Navy plan will implement MFOQA capability for 14 Type/Model/Series (T/M/S) throughout an incremental phased approach. The lead platforms are the F/A-18C/D/E/F Strike Fighter and the EA-18G Growler. Follow-on phases will provide MFOQA capability to the MH-60R/S helicopters,

the CH-53E heavy-lift helicopter, the MV-22B tilt-rotor aircraft, and the T-45 jet trainer, with additional platforms to follow. Platform priorities are driven by several factors, including platform mishap rates, system architecture to support data collection, and fleet concerns.

Developers
Expected to be multiple sources following competition.

SECTION 2

SURFACE COMBATANTS

The Navy's surface force adapts to contribute to all of the Navy's core capabilities. A warship that provides power projection one day can deliver humanitarian aid and provide maritime security the next. Surface ships are on the front line of forward presence, sea control, and power projection, and also provide maritime security, deterrence, and humanitarian assistance.

SHIPS

CG 47 Ticonderoga-Class Aegis Guided Missile Cruiser Modernization

Description

Ticonderoga-class guided missile cruisers provide multi-mission offensive and defensive capabilities and can operate independently or as part of carrier strike groups, expeditionary strike forces, and surface action groups in support of global operations. The 22 currently remaining Ticonderoga-class cruisers have a combat system centered on the Aegis Weapon System and the SPY-1B multi-function, phased-array radar. The combat system includes the Mk-41 Vertical Launching System (VLS), which employs Standard Missile surface-to-air missiles and Tomahawk Land Attack Missiles, advanced undersea and surface warfare systems, embarked sea-control helicopters, and robust command, control, and communications systems in a potent, multi-mission warship.

The Cruiser Modernization program includes Hull, Mechanical, and Electrical (HM&E) upgrades as well as improved quality of life, mission life extension, Integrated Ship's Control (ISC), all-electric auxiliaries, and weight and moment modifications. Combat Systems upgrades include an open-architecture computing environment. Specific improvements include upgrades in air dominance with Cooperative Engagement Capability (CEC), SPY radar upgrades, maritime force protection upgrades with the CIWS 1B, ESSM, Nulka and SPQ-9B, and the SQQ-89A(V)15 anti-submarine warfare suite.

Cruiser Modernization warfighting improvements using an open architecture design will extend the Aegis Weapons System's capabilities against projected threats well into the 21st Century.

Status

Six cruisers have received first phase HM&E upgrades. Full cruiser modernization (Combat Systems & HM&E) has been completed on five of seven B/L 2 cruisers. The two remaining B/L 2 ships will be modernized in FY 2011/2012. Three B/L 3 cruisers will receive the second and final phase Combat System upgrades and will be complete in late FY 2013. The modernization program is expected to continue through FY 2015. Seven of 22 CGs are planned for inactivation beginning with four in FY 2013 and 3 in FY 2014.

Developers

Huntington Ingalls Industries	Pascagoula, Mississippi
Lockheed Martin	Moorestown, New Jersey

DDG 51 Arleigh Burke-Class Aegis Guided-Missile Destroyer

Description

Arleigh Burke-class guided missile destroyers have combat systems centered on the Aegis Weapon System and the SPY-1D(V) multi-function, phased-array radar. The 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 forces. The Flight IIA variants under construction in 2012 incorporate facilities to support two embarked helicopters, significantly enhancing the ship's sea-control capabilities. A Flight III variant, which will incorporate the Air and Missile Defense Radar under development, is in the technology development phase. Trade studies are ongoing to identify other potential technology insertions for additional capability improvements in the warfare mission areas for this variant.

Status

DDG 112 will deliver in FY 2012, completing the legacy, 62-ship DDG 51 line. DDG 112 will be fitted with Aegis combat system Baseline 7 Phase 1R, which incorporates Cooperative Engagement Capability (CEC), Evolved Sea Sparrow Missile (ESSM), improved SPY-1D(V) radar, and open architecture combat systems using commercially developed processors and display equipment.

In FY 2010, the DDG 51 line was restarted to continue production of this highly capable platform. Aegis Baseline 7.1R will be replaced with the Open Architecture Advanced Capability Build (ACB) 12 Aegis Combat System, in development for the DDG Modernization program. The Navy awarded fixed-price Incentive contracts for DDGs 114 and 115: DDG 114 to Huntington Ingalls Industries (HII) and DDG 115 to General Dynamics-Bath Iron Works (BIW). In addition, BIW was the low cost bidder in this three-ship procurement and has been awarded an option for the FY 2012 ship (DDG 116). Contract award is pending congressional authorization and appropriation.

The Navy will begin to procure DDG 51 Flight III ships beginning with the first Flight III hull in FY 2016.

Developers

General Dynamics Bath Iron Works	Bath, Maine
Huntington Ingalls Industries	Pascagoula, Mississippi
Lockheed Martin	Moorestown, New Jersey

DDG 51 Arleigh Burke-Class Aegis Guided Missile Destroyer Modernization

Description

Arleigh Burke-class guided missile destroyers commenced mid-life modernization in FY 2010 with DDGs 51 and 53. The program will be accomplished in two phases. The first phase will concentrate on the Hull, Mechanical, and Electrical (HM&E) systems to include new gigabit Ethernet connectivity in the engineering plant, a Digital Video Surveillance System (DVSS), an Integrated Bridge System (IBS), an advanced galley, and other habitability and manpower-reduction modifications. A complete open architecture computing environment will be the foundation for warfighting improvements in the second phase of the modernization for each ship. The upgrade plan consists of an improved Multi-Mission Signal Processor (MMSP) to accommodate an integrated air and Ballistic Missile Defense (BMD) capability and an improvement to radar performance in the littoral regions.

Upon the completion of the modernization program, the ships will have the following weapons and sensors: Cooperative Engagement Capability (CEC); Evolved Sea Sparrow Missile (ESSM); Close-In Weapon System (CIWS) Blk 1B; Surface Electronic Warfare Improvement Program (SEWIP); and Nulka. The Arleigh Burke-class Mk-41 Vertical Launching System (VLS) will be upgraded to support SM-3 and newer variants of the Standard Missile family. These two phases will be accomplished on each ship approximately two years apart. DDG 51 guided missile destroyers will continue to provide multi-mission offensive and defensive capabilities with the added benefit of sea-based protection from the ballistic missile threat.

Status

The HM&E modifications have been designed into the most recent new-construction Arleigh Burke-class destroyers, DDGs 111-112. This design in new construction maximizes risk reduction and proves these alterations in the builder's yards, reducing risk in the modernization program. The combat system designed for DDG Modernization is also being forward-fitted into DDG 51 "re-start" commencing with DDG 113. DDG Modernization is mutually supportive with DDG new construction and is intended as the modernization program for the entire class.

Developers

General Dynamics, Bath Iron Works	Bath, Maine
Lockheed Martin	Moorestown, New Jersey

DDG 1000 Zumwalt-Class Destroyer

Description

The DDG 1000 Zumwalt guided missile destroyer will be an optimally crewed, multi-mission surface combatant that fulfills long-range precision land-attack requirements. The three DDG 1000 warships will provide offensive, distributed, and precision fires in support of forces ashore, in addition to other naval warfare missions. Importantly, they will serve as test-beds for advanced technology, such as integrated power systems and advanced survivability features, which can be incorporated into our other ship classes. Other DDG 1000 features include an advanced hull form, optimal manning based on comprehensive human-systems integration and human-factors engineering studies, extensive automation, and advanced apertures. The crew will number approximately 148 Sailors, about half that of a DDG 51-class ship.

Status

The DDG 1000-class was truncated to three ships in August of 2008. DDG 1000 fabrication commenced in February 2009, and Zumwalt is scheduled for delivery in FY 2014. At the start of fabrication, detail design was more than 80 percent complete, surpassing any previous surface combatant in design fidelity. Initial Operational Capability (IOC) is scheduled for FY 2016. DDG 1001 fabrication commenced in February 2010, and the warship is scheduled for delivery FY 2016. DDG 1002 is scheduled to begin fabrication in the third quarter FY 2012 with delivery in FY 2018. The DDG 1000-class is being built by General Dynamics and Huntington Ingalls Industries, with final assembly conducted at General Dynamics Bath Iron Works. DDG 1000 is more than 60 percent complete and DDG 1001 is more than 33 percent complete as of December 2011.

Developers

Huntington Ingalls Industries	Pascagoula, Mississippi
General Dynamics Bath Iron Works	Bath, Maine
Raytheon Systems, Inc	Sudbury, Massachusetts
BAE Systems	Minneapolis, Minnesota

More than 80 companies nationwide, including Lockheed Martin, are also involved with DDG 1000.

FFG 7 Oliver Hazard Perry-Class Guided Missile Frigate Modernization

Description

Oliver Hazard Perry-class frigates are capable of operating as integral parts of carrier strike groups or surface action groups. They are primarily used today to conduct maritime interception operations, presence missions, and counter-drug operations. A total of 55 Oliver Hazard 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, 26 remain in active commissioned service in early 2012.

Status

Oliver Hazard Perry-class frigates are undergoing a modernization program that commenced in FY 2003 and completes in FY 2012. The improvements will assist the class in reaching its 30-year expected service life. It corrects the most significant class maintenance and obsolescence issues, including replacing four obsolete ship service diesel generators (SSDG) with COTS SSDGs, obsolete evaporators with COTS reverse osmosis units, and trackway boat davits with COTS Slewing Arm Davits (SLADs). Other major HM&E alterations included ventilation modifications and Auxiliary Machinery Room #3 fire-fighting sprinkler modifications. All ships have been completed with the exception of USS Rodney M Davis (FFG 60), that who began its COTS SSDG upgrade in October 2011. Decommissioning of the remaining 26 FFGs is scheduled to occur prior to FY 2019. The LCS will replace the capacity and capability of the FFG 7-class.

Developers

General Dynamics, Bath Iron Works	Bath, Maine
Todd Shipyards	Los Angeles, California
	Seattle, Washington

LCC Blue Ridge-Class Command Ship Extended Service Life Program (ESLP)

Description

The two LCC 19 class ships are the Navy's only Command and Control platforms, acting as command ships for C6F and C7F. They directly impact 6th/7th fleet ability to interoperate effectively with RIMPAC and European nations and as well as providing proper Command and Control for 5th/6th/7th fleet commands.

LCC Extended Service Life Program will extend the life of both warships into 2039. Based on a detailed ship assessment, modernization is required to key critical ship systems over the next several years to ensure the new service life is met, maintenance costs are reduced, safety risks are reduced and the quality of Sailors' lives improve onboard.

Status

The program consists of numerous availabilities including periods in the drydock coordinated with the fleet and program office. LCC 20 has completed the first of her availabilities this year and returned to service.

Developers

Puget Sound Naval Ship Yard (PSNSY)	Bremerton, Washington
Naval Surface Warfare Center	
Carderock Division	Philadelphia, Pennsylvania

LCS 1/LCS 2 Littoral Combat Ship

Description

Future joint and combined operations will hinge on our ability to provide access in the face of unpredictable and asymmetric threats. This has been recognized for some time; however, the events of the last decade have brought a renewed sense of urgency to these missions, particularly in the world's littorals. The anti-access threats challenging our naval forces in the littorals include quiet diesel submarines armed with torpedoes and mines, and small, highly maneuverable surface-attack craft. Such threats have great potential to be effectively employed by many less-capable countries and non-state actors to prevent unhindered access by U.S. forces to littoral areas.

The Littoral Combat Ship (LCS) is a key element of Navy's future force and is optimized to defeat these anti-access threats in the littorals. It uses an open architecture design, modular weapons and sensor systems, and a variety of manned and unmanned vehicles to help gain, sustain, and exploit littoral maritime supremacy, ensuring U.S. Joint Force access to critical theaters. Technology has matured to the point where significant warfighting capability can be employed from a small, focused-mission warship like the LCS. LCS will capitalize on emerging unmanned vehicle, sensor, and weapons technologies to deliver the focused missions of Mine Countermeasures (MCM), Surface Warfare (SUW), and Anti-Submarine Warfare (ASW). Focused-mission LCS mission packages are being developed incrementally in order provide capabilities critical to forcible entry, sea/littoral superiority, and homeland defense missions.

The first increment of the MCM mission package will accomplish deep and shallow water mine detection as well as deep-water mine neutralization and surface sweep. Supporting systems include the AN/WLD-1 Remote Minehunting System and the AQS-20A Mine-Hunting Sonar. The first increment of the SUW package will defend against the small boat threat. Supporting systems include one 57mm gun, two 30 mm guns, and the MH-60S Seahawk helicopter with the Hellfire missile. The ASW mission package will provide in-stride ASW detection and tracking. Supporting systems include the Variable Depth Sonar (VDS), Multi-Functioned Towed Array, Light Weight Tow, and the MH-60R Seahawk helicopter.

The ship also possesses inherent capabilities to conduct missions supporting Intelligence, Surveillance and Reconnaissance (ISR), special operations, intra-theater lift, anti-terrorism/force protection, and maritime interdiction. Fully self-deployable and capable of sustained underway operations from homeports to any part of the world, LCS will have the speed, endurance, and underway replenishment capabilities to transit and operate independently, with surface action groups, or with carrier or expeditionary strike groups.

Status

In May 2004, Navy awarded two contracts options to Lockheed Martin and General Dynamics to build the first LCS ships. The Lockheed Martin design is a steel semi-planing monohull. The General Dynamics design is an aluminum trimaran hull. USS Freedom (LCS 1), the first Lockheed Martin ship, was commissioned in November 2008 and conducted a successful early deployment in spring of 2010. USS Independence (LCS 2), the first General Dynamics ship, was commissioned in January 2010. Both ships are undergoing post-delivery tests and trials. Fixed price type contracts were awarded for LCS 3 (Fort Worth, Lockheed Martin) and LCS 4 (Coronado, General Dynamics) in 2009. Both ships are under construction and scheduled to deliver in 2012. In December 2010, the Navy received congressional authorization to proceed with a dual-block buy procuring 20 LCS, ten of each design, through FY 2015. The Navy has since awarded fixed price type contracts to Lockheed Martin and Austal USA (formerly teamed with General Dynamics) for the first of these ships (LCS 5 – LCS 8).

The first two SUW and MCM mission packages have been delivered. The third of each will deliver in 2012. The first ASW mission package was delivered, but it will be replaced by a reconfigured, more capable ASW mission package under development in early 2012.

Developers

Lockheed Martin and	
Marinette Marine (LCS 1 and 3)	Marinette, Wisconsin
General Dynamics and Austal (LCS 2 and 4)	Mobile, Alabama
Austal USA (LCS 6, LCS 8)	

PC 1 Cyclone-Class Patrol Coastal Modernization Program (PC Mod)

Description

Cyclone-class Patrol Coastal (PC) ships are essential for conducting theater security cooperation, maritime security, and intelligence, surveillance and reconnaissance operations in the littorals. PCs are uniquely suited to operating with numerous partner navies and in the "green water/brown water seam." Fourteen Cyclone-class ships were built; 13 are operating with the U.S. Navy, and one was transferred to the Philippine Navy in 2004.

PC Mod corrects the most significant maintenance and obsolescence issues and will extend the life of the class to a 30-year expected service life (2023-2026). The program includes significant alterations such as a main propulsion diesel engine pool and upgrading diesel generators and reverse osmosis units. A finite element analysis of the hull and subsequent repairs is being conducted in early 2012. Additional hull, mechanical, and electrical modifications and updates to the weapons systems and C4ISR suite are also included.

Status
The 13-ship PC class modernization program commenced in FY 2008 and is scheduled for completion by 2017.

Developers
Various.

WEAPONS

Advanced Gun System (AGS)

Description
The 155mm AGS is a fully integrated, automatic gun and magazine weapon system on board Zumwalt DDG 1000-class warships to provide precision, volume, and sustained naval surface fires in support of distributed joint and coalition forces ashore. Each 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, fully integrated into DDG 1000, is designed to meet reduced manning and radar-signature requirements.

Status
AGS manufacturing is underway at three facilities (Cordova, Alabama; Fridley, Minnesota; and Louisville, Kentucky) and on track to meet DDG 1000's production schedule.

Developers
BAE Systems Minneapolis, Minnesota

Mk-15 Phalanx Close-In Weapon System (CIWS)

Description
Mk-15 Mod-21-28 Phalanx CIWS is an autonomous combat system that searches, detects, tracks (radar and electro-optic), and engages threats with a 20mm Gatling gun capable of firing 4,500 tungsten penetrator rounds per minute. Integral to ship self-defense and the anti-air warfare "defense-in-depth" concept, CIWS provides terminal defense against anti-ship missiles and high-speed aircraft penetrating other fleet defenses. Phalanx CIWS can operate autonomously or be integrated with a ship's combat system.

The Block 1B configuration provides further defense against asymmetric threats such as small, fast surface craft, slow-flying fixed- and rotary-winged aircraft, and unmanned aerial vehicles through the addition of an integrated Forward-Looking Infra-Red (FLIR) sensor. Block 1B also incorporates an optimized gun barrel (OGB) for tighter ordnance dispersion. Enhanced Lethality Cartridges (ELC) can be used with the OGB for improved target penetration. Mk-15 Mod-29 CIWS is the land-based Phalanx Weapon System (LPWS) configuration developed to counter rocket, artillery, and mortar attacks against ground forces. LPWS uses the inherent capabilities of CIWS Block 1B mounted on a trailer with portable power generation and cooling systems. The

LPWS is deployed as part of the Counter-Rocket, Artillery, and Mortar (C-RAM) program by the U.S. Army at several forward operating bases (FOBs), defending U.S. personnel and assets as part of *Operation New Dawn* and *Operation Enduring Freedom*.

Mk-15 Mod-31 is the SeaRAM CIWS system. SeaRAM is also based on the Block 1B Phalanx configuration, with the gun subsystem replaced by an 11-round Rolling Airframe Missile (RAM) launcher. SeaRAM can be integrated with ship's combat system, but is capable of autonomously searching, detecting, tracking, and engaging threats with RAM.

Status

More than 250 Mk-15 Phalanx CIWS systems are deployed in the Navy in early 2012. The Army has procured 45 LPWS systems for FOB defense under the C-RAM program. Two SeaRAM CIWS system have been delivered for installation. One has been installed on board USS Independence (LCS 2) and one is to be installed on USS Coronado (LCS 4) in 2012.

Developers

Raytheon	Louisville, Kentucky Tucson, Arizona

Mk-38 Mod-2 Stabilized 25mm Chain Gun

Description

The Mod-2 program upgrades the Mk-38 Mod-1 25mm chain gun by adding stabilization, remote operation, fire control, and an electro-optical sensor. These additions significantly expand the effective range, lethality, and nighttime capability of the weapon. The program reduces risk for surface ship self-defense by engaging asymmetric threats to ships at close range. It provides the capability to bridge current and future targeting and weapons technology in a close-range force-protection environment, including protection in port, at anchor, transiting choke points, or while operating in restricted waters.

Status

The Mk-38 Mod-2 was initiated in 2003 to improve ship self defense by developing and fielding a mid-term capability for surface ships that is simple, stabilized, and affordable. The program has now fielded 48% of the planned total of gun upgrades. The Mk-38 Mod-2 MGS is being permanently installed on CG 47, DDG 51, LSD 41, LSD 49, LPD 17, PC 1 (USN and USCG), FFG 7, LHD 1, LHA 1, and LCC 19-class ships.

Developers

BAE	Louisville, Kentucky
Rafael USA, Inc.	Bethesda, Maryland

Mk-45 Mod-4 5-Inch/62-Caliber Gun System Upgrade

Description

The Mk-45 Mod-4 5-inch/62-caliber gun is a modification of the 5-inch/54-caliber gun with higher firing energies to support longer-range munitions. The gun retains the functionality of the 5-inch guns, including ability to fire all in-service 5-inch rounds. The modified design also improves maintenance procedures and provides enhanced anti-surface and anti-air warfare performance. Modifications include a longer (62-caliber) barrel, an ammunition recognition system, and a digital control system.

Status

The gun was installed initially in Arleigh Burke-class destroyers, starting with USS Winston S. Churchill (DDG 81), and is being back-fitted into selected Ticonderoga-class cruisers. As of September 2011, 30 destroyers and four cruisers were equipped with the 5-inch/62 gun.

Developers

BAE Systems — Minneapolis, Minnesota

Mk-54 Lightweight Torpedo (LWT)

Description

The Mk-54 LWT is a modular upgrade to the lightweight torpedo inventory and adds the capability to counter quiet diesel-electric submarines operating in the littorals. Mk-54 LWT combines existing torpedo hardware and software from Mk-46, Mk-50, and Mk-48 Advanced Capability (ADCAP) programs with advanced digital COTS electronics. The resulting Mk-54 LWT offers significantly improved shallow water capability at reduced life-cycle costs. The Mk-54 LWT modernization plan will introduce new hardware and software updates providing stepped increases in probability of kill, while reducing life-cycle cost and allowing the torpedo to remain ahead of the evolving littoral submarine threat. Mk-54 will replace the Mk-46 as the payload in the Vertical Launch Anti-Submarine Rocket (VLA).

Status

Full rate production began in FY 2005, with a procurement of 94 torpedoes. Following resolution of production and quality control issues, Mk-54 torpedoes are once again being delivered. Mk-46 torpedo maintenance has been augmented to supplement LWT inventory while Mk-54 inventory is built up. The Mk-54 VLA achieved Initial Operational Capability in March 2010.

Developers

LWT: Raytheon — Mukilteo, Washington
VLA: Lockheed Martin — Akron, Ohio

Mk-57 NATO Sea Sparrow Missile System (NSSMS) RIM-7P NATO Sea Sparrow Missile and RIM-162 Evolved Sea Sparrow Missile (ESSM)

Description

Mk-57 NSSMS and its associated RIM-7P NSSM or RIM-162 ESSM serves as the primary surface-to-air ship self-defense missile system. NSSMS is deployed on aircraft carriers and Wasp-class amphibious assault ships and is being installed on the newest class of amphibious assault ships. The Mk-57 air-defense Target Acquisition System is a combined volume-search radar and control element that determines threat evaluation and weapon assignment for RIM-7 in LHDs and CVNs. A kinematic upgrade to the RIM-7P missile, ESSM is the next generation of Sea Sparrow missiles and is deployed on Arleigh Burke-class Flight IIA Aegis destroyers. ESSM is also the primary self-defense weapon for DDG 1000, CVN, and LHA 6-class ships, as well as Aegis cruisers and destroyers receiving Aegis Modernization.

ESSM upgrades include a more powerful rocket motor, tail control section for quick response on VLS ships, upgraded warhead, and a quick-reaction electronic upgrade. Enhanced ESSM kinematics and warhead lethality leverage the already robust RIM-7P guidance capability to provide increased operational effectiveness against high-speed, maneuvering, hardened anti-ship cruise missiles at greater intercept ranges than now possible with RIM-7P. Operational in FY 2004, ESSM is procured under the NATO Sea Sparrow Consortium involving ten NATO countries.

Status

NSSMS is in production for LHA 6 and CVN 78 and is fielded on some CG47, DDG 51 Flight IIA, and all CVN 68-class ships and will soon be deployed on DDG 1000, LHD 7 and 8, LHA 6, and the remainder of the CGs, DDGs, and LHDs through planned modernization programs. LHA 5 remains RIM-7P "shooter." By 2025, about 114 U.S. Navy ships will be armed with ESSM. ESSM Joint Universal Weapon Link (JUWL) development is on track and Interrupted Continuous Wave Illumination (ICWI) already incorporated. DDG 1000 and CVN 78 will require unique variant of ESSM with both ICWI and JUWL incorporated. There is Consortium interest in developing a next-generation ESSM with an active/semi-active dual-mode seeker.

Developers

Raytheon — Tucson, Arizona

Naval Surface Fire Support (NSFS)

Description

Naval Surface Fire Support is the surface Navy's contribution to the joint triad of fires—NSFS, close air support and ground artillery/rocket systems—that provides fire support to military units operating ashore by engaging targets through area bombardment and precision attack. The Navy invests in an array of systems to enhance our capability to provide effective NSFS:

- Enhanced networking capabilities, including an improved supporting arms coordination center on large-deck amphibious

ships and the Naval Fires Control System on DDG 51 Flight IIA-class destroyers

- Unmanned air vehicles for intelligence, surveillance, and reconnaissance
- Mk-45 Mod-4 5-inch/62 guns
- DDG 1000 armed with the Advanced Gun System and Long-Range Land-Attack Projectiles

Status
LRLAP is scheduled to reach initial operational capability in FY 2016.

Developers

BAE	Minneapolis, Minnesota
Lockheed Martin Missile and Fire Control	Orlando, Florida

RGM/UGM 109E Tomahawk Land-Attack Missile (TLAM)

Description
TLAM is Navy's premier, all-weather, long-range, subsonic land-attack cruise missile deployed on surface warships and attack and guided missile submarines. The Block IV Tactical Tomahawk (TACTOM RGM 109E/UGM 109E) preserves Tomahawk's long-range precision-strike capability while significantly increasing responsiveness and flexibility.

TACTOM improvements include in-flight retargeting, the ability to loiter over the battlefield, in-flight missile health and status monitoring, and battle damage indication imagery, providing a digital look-down "snapshot" of the battlefield via a satellite data link. Other improvements include rapid mission planning and execution via Global Positioning System (GPS) onboard the launch platform, improved anti-jam GPS, and alternative payloads that include smart sub-munitions, a penetrator warhead, and a multiple-response warhead.

Plans call for the Navy to procure more than 3,000 TACTOM missiles. TLAM Block III missiles will be retired from service by 2020.

Status
A full-rate production contract was signed in August 2004, the Navy's first multi-year contract for TACTOM procurement of more than 1,500 missiles. This contract ended in FY 2008, and all missiles have been delivered. Subsequent Tomahawk Block IV procurement in FY 2009-2011 was under firm fixed-price contracts. Tomahawks are currently being procured at the minimum sustainable rate.

Developers

Raytheon Missile Systems	Tucson, Arizona

RIM-116A Rolling Airframe Missile (RAM)

Description

The RIM-116A RAM is a high-firepower, low-cost system based on the AIM-9 Sidewinder air-to-air missile to defeat anti-ship cruise missiles (ASCMs) as well as other airborne threats. RAM is a 5-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 is autonomous after launch. Effective against a wide spectrum of existing threats, RAM Block 1 IR upgrade incorporates IR "all-the-way-homing" to improve performance against evolving passive and active ASCMs. Plans are for RAM to evolve and keep pace with emerging threats. RAM Block 2, in the System Development and Demonstration (SDD) phase, will provide increased kinematic capability against highly maneuvering threats and improved RF detection against low probability of intercept threats.

The RAM program is a cooperative partnership with Germany, and the Block 2 missile is being developed jointly (50/50) with Germany.

Status

RAM is installed in Tarawa (LHA 1)- and Wasp (LHD 1)-class amphibious assault ships, Whidbey Island (LSD 41) and Harpers Ferry (LSD 49)-class dock landing ships, San Antonio (LPD 17)-class landing platform dock ships, aircraft carriers (CVNs), and Freedom (LCS 1) class, the Lockheed Martin variants of the Littoral Combat Ship.

In 2001, an engineering change proposal called out the SeaRAM configuration, which removed the Phalanx Gun System from the Close-In Weapon System (CIWS) and incorporated an 11-round RAM missile launcher system. The close-in battlespace was increased by modifying the Phalanx radar to detect low-elevation, low-radar cross-section threats at greater range. No missile modifications were required. General Dynamics incorporated SeaRAM in USS Independence (LCS 2) variants of the Littoral Combat Ship.

Block 1A is at full-rate production. The Block 2 missile is in development and scheduled to reach IOC in FY 2013. Tomahawk Block IV procurement continues under a firm fixed-price contract."

Developers

Raytheon	Tucson, Arizona
RAMSYS GmbH	Ottobrunn, Germany

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

Description

The RIM-66C SM-2 is the Navy's primary air-defense weapon. 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 15 allied navies. SM-2 enables forward naval presence, littoral operations, and projecting and sustaining U.S. forces in anti-access or area-denial environments. SM-2 Block III/IIIA/IIIB missiles are launched from the Mk-41 Vertical Launching System (VLS) installed in Aegis cruisers and destroyers. Block

III features improved performance against low-altitude threats and optimizes the trajectory-shaping within the Aegis command guidance system by implementing shaping and fuse altimeter improvements. Block IIIA features improved performance and lethality against sea-skimming threats due to a new directional warhead and addition of a moving target indicator fuse design. Block IIIB adds an infrared-guidance mode capability developed in the Missile Homing Improvement Program to improve performance in a stressing ECM environment. Blocks IIIA/IIIB will be the heart of the SM-2 inventory for the next 20 years. The latest generation of Block IIIB missiles includes a maneuverability upgrade (SM-2 Block IIIBw/MU2) to enhance IIIB performance against low-altitude, supersonic maneuvering threats.

Status

The SM-2 program transitioned to the sustainment phase with the cancellation of All-Up-Round production and the Service Life Extension Program in FY 2011 and FY 2012, respectively. Navy plans to establish a Limited Depot (FY 2013) and Rocket Motor Regrain program (FY 2014) to maintain the inventory out to the 2030 timeframe. This will allow the SM-2 inventory to keep pace with the Navy's 30-year shipbuilding plan, keep infrastructure in place to convert SM-2 Blk IIIB missiles to unique Interrupted Continuous Wave Illumination/Joint Universal Weapon Link variants for Zumwalt (DDG 1000)-class ships, and support projected increases in fleet proficiency firings.

Developers

Raytheon — Tucson, Arizona

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

Description

SM-6 is the U.S. Navy's next-generation extended-range anti-air warfare (AAW) interceptor missile. The introduction of active-seeker technology to air defense in the surface fleet reduces Aegis Weapon System reliance on illuminators and provides improved performance against stream raids and targets by employing advanced characteristics such as enhanced maneuverability, low-radar cross-section, improved kinematics, and advanced electronic countermeasures. The SM-6 ERAM acquisition strategy is a low-risk developmental approach, which leverages SM-2 Block IV/IVA program non-developmental items and the Raytheon/Naval Aviation Advanced Medium-Range Air-to-Air Missile Phase 3 active seeker program. The SM-6 missile will be fielded on Arleigh Burke-class destroyers and Ticonderoga-class cruisers.

Status

The Navy established the SM-6 Extended-Range Air Defense program in FY 2004. SM-6 received permission to proceed with LRIP Lot 3 and procure long-lead material in April 2011. The program completed initial operational test and evaluation in July 2011 and is expected to obtain full rate production approval in the April 2012 timeframe.

Developers

Raytheon — Tucson, Arizona

SURFACE SENSORS AND COMBAT SYSTEMS

Aegis Ashore

Description

On September 17, 2009, the President announced an overarching plan to provide regional missile defense to U.S. deployed forces and allies called a Phased Adaptive Approach (PAA). The PAA tailors U.S. ballistic missile defense (BMD) capabilities to specific theater needs and to enhance integrated regional missile defenses against medium, intermediate, and ultimately intercontinental range ballistic missiles. Aegis Ashore is a bold and innovative adaptation of Navy's proven and flexible Aegis BMD capability. Repackaging components of the Aegis Weapons System (AWS) into modular containers, deploying them to pre-prepared sites in host-nations to constitute a BMD capability, is an elegantly simple concept with unique challenges. The Missile Defense Agency (MDA), as the Aegis Ashore material developer, funds development, procurement, and installation of BMD systems, peripherals, and SM-3 missiles. The Director, MDA is designated the Acquisition Executive for the U.S. Ballistic Missile Defense System (BMDS). In this capacity, MDA exercises all source-selection and milestone decision authorities for all elements of the BMDS up to, but not including, production issues.

Status

In early 2012, engineering level details on Aegis Ashore have not been fully developed. The first Aegis Ashore site, the Aegis Ashore Missile Defense Test Complex (AAMDTC) at the Pacific Missile Range Facility (PMRF), Kauai, Hawaii, is scheduled to be completed in 2014, and the first forward operating site in Eastern Europe will be operational in late 2015. Detailed deckhouse design is ongoing, being led by Lockheed Martin in collaboration with Black & Veatch, Gibbs & Cox, and Carlson Technology. The Naval Sea Systems Command (NAVSEA) and MDA established an Aegis Ashore Hybrid Program Office within the Aegis BMD directorate, which will closely coordinate efforts with the Navy's Program Executive Office for Integrated Warfare Systems (PEO IWS) and oversee Aegis Ashore development and deployment.

Developers

Lockheed Martin	Moorestown, New Jersey
Black & Veatch Corp.	Overland Park, Kansas
Gibbs & Cox Inc	Arlington, Virginia
Carlson Technology Inc	Livonia, Michigan

Aegis Combat System (ACS)

Description

The Aegis Combat System (ACS) is a centralized, automated, command-and-control (C2) and weapons control system. ACS integrates combat capabilities developed in other Navy programs into the Ticonderoga (CG 47)-class and Arleigh Burke (DDG 51)-class multi-mission guided missile warships and provides effective capability to counter current and future air, surface, and sub-surface threats. ACS is not a separate Acquisition Category program; it is part of the Aegis Shipbuilding (ACAT 1) Program.

Status

ACS has been in the Fleet since 1983 and continues to serve as the platform for new capabilities, weapons, and sensor systems. The Aegis Modernization (AMOD) program is producing system upgrades via the Advanced Capability Build (ACB) process for CG and DDG Modernization, DDG Restart and DDG FLT III to keep pace with evolving threats and the challenging littoral environment.

The first iteration of this process, ACB-08/Technical Insertion (TI) 08, brings CGs 52-58 increased warfighting capabilities during cruiser modernizations, which began in 2009. ACB-08 separates hardware from software, allowing for commercial, off-the-shelf (COTS) computer processors, and re-uses elements of the Aegis Baseline 7.1R computer program code, while integrating improved system capabilities.

ACB-12 will bring increased warfighting capabilities, including BMD, Naval Integrated Fire Control-Counter Air (NIFC-CA), Evolved Sea-Sparrow Missile (ESSM), Close-In Weapon System (CIWS) Blk 1B, SM-6 missile, and Multi-Mission Signal Processor, during CG/DDG Mod availabilities beginning in 2012. ACB-12 initiates a common computer program library for Aegis and brings in the first third-party developed software element, Track Manager/Track Server, as well as the competitively awarded Common Display System (CDS) and Common Processor System (CPS).

In the future, the ACB process will bring new capabilities to in-service ships in a single package vice the legacy method of installing capability improvements through individualized deliveries. These capabilities will be fully integrated into the ACS for maximum effectiveness. In addition, there will be greater commonality across ACBs. This will ultimately result in an increased number of improved capability deliveries at a reduced cost.

Developers

Lockheed Martin	Moorestown, New Jersey
Naval Surface Warfare Center	Dahlgren, Virginia
Naval Surface Warfare Center	Port Hueneme, California

Air and Missile Defense Radar (AMDR)

Description

The AMDR advanced radar system is being developed to fill capability gaps identified by the Maritime Air and Missile Defense of Joint Forces (MAMDJF) Initial Capabilities Document (ICD). AMDR is a multi-function, active-phased array radar capable of search, detection, and tracking of airborne and ballistic missile targets, and missile engagement support. AMDR consists of an S-band radar (AMDR-S), initially a SPQ-9B and a Radar Suite Controller (RSC). The radar will be developed to support multiple ship classes with the first increment of development in support of DDG51 FLT III. The multi-mission capability will be effective in both air dominance of the battle space (Area Air Defense) and in defense against ballistic missiles (BMD).

Status
AMDR is a Pre-ACAT-1D program with Milestone A approval. The Technology Development (TD) phase commenced in early FY 2011.

Developers
Northrop Grumman, Raytheon, and Lockheed Martin were awarded TD contracts to produce small-scale active phased array (S-band) prototypes during Technology Development, scheduled to complete in fall 2012.

AN/SPY-1 AEGIS Multi-Function Phased-Array Radar

Description
The AN/SPY-1 S-Band radar system is the primary air and surface radar for the Aegis Combat System installed in Ticonderoga-class and Arleigh Burke-class warships. It is a multi-function, passive phased-array radar capable of search, automatic detection, transition to track, tracking, and missile engagement support against air and surface targets. The fifth variant of this radar, AN/SPY-1D(V), improves the radar's capability against low-altitude and reduced radar cross-section targets in heavy clutter environments, and in the presence of intense electronic countermeasures. The AN/SPY-1 series radars are also used to detect, track, and engage theater ballistic missiles on selected Aegis cruisers and destroyers.

Status
The SPY-1A, SPY-1B, SPY-1D, and SPY-1D(V) radar variants are fielded and supported. The AN/SPY-1D(V) littoral radar upgrade supersedes the AN/SPY-1D in new-construction Flight IIA destroyers that began in FY 1998. Operational testing and evaluation was completed in the fall 2005. AN/SPY-1D (V) is installed in DDGs 91 through 112 and programmed for installation in DDGs 113 through 115. A new Multi-Mission Signal Processor (MMSP) is funded and will deliver AN/SPY-1D (V) capability to AN/SPY-1D. MMSP upgrades will be deployed through the DDG Modernization programs.

Developers

Lockheed Martin	Moorestown, New Jersey
Raytheon	Sudbury, Massachusetts

AN/SPY-3 MFR Advanced Multi-Function Radar (MFR)

Description
The AN/SPY-3 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 anti-ship cruise missile threats and support fire control illumination requirements for the Evolved Sea Sparrow Missile, the Standard Missile (SM)-2, and future missiles. The MFR also supports the new ship-design requirement for reduced radar cross-section, significantly reduced manning (no operators), and total ownership cost (TOC) reduction. The MFR is planned for introduction with Zumwalt DDG 1000-class destroyers and the

next-generation CVN 78-class aircraft carriers (as part of the Dual-Band Radar system). For DDG 1000, MFR will be modified to provide above horizon and volume search capability.

Status

Two MFR Engineering Development Model radar arrays were installed and tested at the Wallops Island, Virginia, land-based test facility and on board the Navy's Self-Defense Test Ship in 2006. MFR was installed at the Wallops Island Engineering Test Center along with the S-band Volume Search Radar (VSR). Both underwent radar test and integration events that completed at the end of FY 2010. MFR development, testing, and production schedules are planned to support equipment delivery schedules for DDG 1000 destroyers and CVN 78-class carriers (as part of the Dual Band Radar system). MFR will deliver on DDG 1000 in FY 2015.

Developers

Raytheon Electronic Systems (Prime) Sudbury, Massachusetts

Joint Biological Agent Identification and Diagnostic System (JBAIDS)

Description

The Joint Biological Agent Identification and Diagnostic System (JBAIDS) is an integrated system for rapid identification and diagnostic confirmation of biological agent exposure or infection. Based on commercially available technology, JBAIDS is portable and reusable, and will be capable of the simultaneous identification of Biological Warfare Agents (BWAs), H1N1 influenza, and other pathogens of operational concern. The system includes sampling and analysis equipment, a laptop computer for testing result readout display, and assay reagent test kits. JBAIDS will replace the current Light Cycler PCR (Polymerase Chain Reaction) system in the medical spaces of all CVNs and LHA/LHDs.

Status

JBAIDS is installed on 19 large-deck ships (CVNs, LHAs and LHDs) with five remaining for ships in extended maintenance periods and new construction. Remaining installs to large decks are planned for FY 2013-2015. In FY 2011, the Navy will field 15 additional units in support of ashore medical facilities (e.g., Forward-Deployed Preventive Medical Units (FDPMU)).

Developers

Joint Program Manager Chemical Fort Detrick, Maryland
Idaho Technologies, Inc Salt Lake City, Utah

Photo courtesy of Idaho Technology.

Maritime Integrated Air and Missile Defense Planning System (MIPS)

Description

Maritime Integrated Air and Missile Defense Planning System (MIPS) is an operational-level Integrated Air and Missile Defense (IAMD) planning tool that supports the Joint Force Maritime Component Commander (JFMCC) staff in rapidly developing optimized courses of action for the deployment of Navy air and missile defense assets. MIPS allows the commander and staff to visualize an end-state and determine the most effective way to reach that end-state. MIPS provides the JFMCC a tool to allocate resources and assess risks in a timely manner. The product is an operational-level plan detailing the optimized use of forces developed with the warfighter's knowledge and judgment. The combined warfighter and MIPS product promotes an orderly handover of a Maritime Integrated Air and Missile Defense Plan to those tasked with execution of an operation. MIPS has been deployed in the Maritime Operations Centers (MOC) of all numbered fleet commanders likely to be assigned as JFMCC, as well as in selected higher headquarters.

Status

MIPS 0 was formerly known as the Area Air Defense Commander Capability System. MIPS 1, the program of record replacement of legacy hardware, maintains functionality and capability in MIPS 0 and will include enhanced planning capacity for ballistic missile defense (BMD) as well as an interface between the Aegis BMD Mission Planner and Missile Defense Agency's Command, Control, Battle Management, and Communications (C2BMC) System. MIPS 1 will reach IOC in October 2012. MIPS Increment 2 is envisioned to be a software application in Consolidated Afloat Network Enterprise System (CANES) architecture and is planned to incorporate new IAMD capabilities—the Naval Integrated Fire Control–Counter Air, Standard Missile (SM)-6, and BMD Engage-on-Remote. The MIPS program was designated a Navy ACAT III acquisition program on February 11, 2011.

Developers

General Dynamics Advance Information Systems	Fairfax, Virginia
Lockheed Martin	Moorestown, New Jersey

Naval Fires Control System (NFCS)

Description

Naval Fires Control System (NFCS) allows surface warships to communicate directly with ground forces that operate within the Advanced Field Artillery Tactical Data System (AFATDS), a digital fire-support command and control network used by the Army and Marine Corps. NFCS is interoperable with joint C4ISR systems, providing the mission-planning and fire-support coordination functions required to support expanded NSFS mission capability.

Status
The system achieved IOC in April 2006 with 29 systems currently installed. A total of 32 systems will be fielded by the end of FY 2012.

Developers

Naval Surface Warfare Center; Dahlgren	Dahlgren, Virginia
Space and Naval Warfare Systems Center	San Diego, California
Naval Undersea Warfare Center; Keyport	Keyport, Washington
General Dynamics Information Systems	Arlington, Virginia
GEC-Marconi Electronics Systems	Wayne, New Jersey

Navy Ballistic Missile Defense (BMD)

Description
Aegis BMD includes modifications to the Aegis Weapon System and development and upgrade of the Standard Missile 3 (SM-3) with a hit-to-kill kinetic warhead. BMD ships have both the Long Range Surveillance and Tracking (LRS&T) capability, with an ability to provide cueing in defense of the homeland, and a BMD engagement capability using the SM-3 missile to conduct active defense against short and medium-range ballistic missiles. This combination gives select Aegis cruisers and destroyers capability to intercept short and medium-range ballistic missiles in the ascent, midcourse, and descent phases of their exo-atmospheric trajectories. Together, these capabilities contribute to robust defense-in-depth for U.S. and allied forces, vital political and military assets, population centers, and large geographic regions against the threat of ballistic missile attack. The Missile Defense Agency and Navy deployed the Aegis BMD long-range surveillance and tracking capability as an element of the Ballistic Missile Defense System (BMDS) in October 2004. The Aegis BMD short and medium-range ballistic missile engagement capability was certified for operational use in August 2006.

Status
As of early 2012, 24 cruisers and destroyers have been modified to conduct BMD with additional ships to be modified in the future. The SM-2 Block IV inventory has been modified for the terminal ballistic missile defense mission. This capability provides an endo-atmospheric "lower-tier" capability resulting in a more lethal, layered defense against enemy ballistic missiles. To facilitate terminal defense, the Aegis BMD 3.6.1 program capability has been installed in 22 BMD capable Aegis ships. The ongoing Aegis Modernization program will eventually provide BMD capability to remaining Aegis destroyers beginning in 2012.

Developers

Lockheed Martin	Moorestown, New Jersey
Raytheon	Tucson, Arizona

Open Architecture OA

Description

OA is a business strategy for rapidly fielding superior, cost-effective warfighting systems. Naval OA is the confluence of business and technical practices yielding modular, interoperable systems that adhere to open standards with published interfaces. This approach increases opportunities for competitive innovation, enables re-use of components, facilitates rapid technology insertion, and reduces testing and maintenance constraints.

Status

The Surface Navy has programmed funding for OA since 2003. The Aegis Combat System Modernization plan started with a technical undertaking to implement an open architecture design by de-coupling hardware from software for cost-effective COTS sustainment. Five of seven Aegis cruisers have been modernized with the initial Aegis Advance Capability Build (ACB-08), and the remaining two are on-track to complete in 2012. ACB plan continues transition in 2012 with ACB-12 for the remaining CGs, as well as for both DDG-113 restart and DDG modernizations. A separate ACB-12 is planned for technical refresh of the Ship Self-Defense System (SSDS) Mk-2 in aircraft carriers and amphibious ships. All modern surface combat systems (Aegis, SSDS, LCS 1 & 2, and DDG 1000) are being coordinated to ensure development of scalable, modular software application components and to provide greater business opportunities for competitive alternatives. A request for proposals (RFP), which is the first competition since 1969, has been issued for the Aegis Combat System Engineering Agent (CSEA) starting with ACB-16. The acquisition-led OA Enterprise Team (OAET) is adopting broader business aspects of open architecture for more collaborative competition within and across programs, including small business involvement through the ONR-led Small Business Innovative Research (SBIR) program, to deliver cost-effective, common capability quickly and more efficiently to the Fleet.

Developers

More than 80 companies nationwide, including:

Lockheed Martin	Moorestown, New Jersey
	Syracuse, New York
	Eagan, Minnesota
Advanced Acoustic Concepts	Hauppauge, New York
BAE Systems	Arlington, Virginia
General Dynamics Advanced Information Systems	Fairfax, Virginia
	Arlington, Virginia
	Pittsfield, Massachusetts
General Dynamics Bath Iron Works	Bath, Maine
Huntington Ingalls Industries	Pascagoula, Mississippi
Northrop Grumman PRB Systems	Goleta, California
Raytheon	St. Petersburg, Florida
	Sudbury, Massachusetts
	San Diego, California
Raytheon Missile Systems	Tucson, Arizona
Sippican	Marion, Massachusetts

Space and Naval Warfare Systems Center	San Diego, California
Johns Hopkins University Applied Physics Laboratory	Laurel, Maryland
SECHAN Electronics	Lititz, Pennsylvania
Integrated Combat Systems Test Facility	Dam Neck, Virginia
Naval Surface Warfare Center	Dahlgren, Virginia
Naval Surface Warfare Center	Port Hueneme, California
Naval Undersea Warfare Center	Keyport, Washington
Naval Undersea Warfare Center	Newport, Rhode Island

S-Band Volume Search Radar (VSR)

Description

VSR is an S-band active phased array radar designed to meet all above-horizon detection and tracking requirements for 21st Century ships without area air-defense missions, specifically the CVN 78-class. VSR will provide long-range situational awareness with above-horizon detection and air control functionality, replacing in-service rotating SPS-48E and SPS-49 radars. A non-rotating phased-array radar, VSR provides the requisite track revisit times to address fast, low/small, and high-diving missile threats, and provides cueing for the AN/SPY-3 Multi-Function Radar (MFR) to execute tracking and fire control functions above the horizon.

Status

A VSR Engineering Development Model was completed in 2006 and installed at the Wallops Island Engineering Test Center. Along with the MFR, VSR underwent radar test and integration events that completed at the end of FY 2010. VSR will be fielded with MFR, as an integrated radar suite, referred to as the Dual-Band Radar (DBR) on CVN-78, scheduled to deliver in FY 2015.

Developers

Raytheon Electronic Systems	Sudbury, Massachusetts
Lockheed Martin Maritime Sensors & Systems	Moorestown, New Jersey

Ship Self Defense System (SSDS)

Description

SSDS is a centralized, automated, command-and-control self-defense system. An upgrade from the Advanced Combat Direction System (ACDS), SSDS provides an integrated combat direction system for aircraft carriers and amphibious ships, enabling them to keep pace with evolving anti-ship cruise missile (ASCM) threats. Using an open architecture system, SSDS integrates detection and engagement elements of the combat system with automated weapons control doctrine, Cooperative Engagement Capability (CEC), and tactical data links for enhanced battlespace awareness. SSDS thus provides a robust self-defense capability.

Status

SSDS Mk-1 began full-rate production following operational testing in 1997 and is fielded in all LSD 41/49-class ships. SSDS

Mk-2 (which provides strike group interoperability via CEC and TADIL J) achieved IOC in 2005 and continues fleet installation. With the SSDS federated and technically decoupled architecture, Navy plans to upgrade SSDS periodically via COTS "tech insertion" and Preplanned Product Improvement (P3I). SSDS Mk-2 is programmed for all CVN 68/78, LHD 1/LHA 1, and LPD 17-class ships. SSDS Mk-2 will replace SSDS Mk-1 on LSD 41/49-class ships beginning in 2013 and will complete fielding by 2015. A separate Advanced Capability Build (ACB) program beginning with ACB-12 is planned for technically refreshing the SSDS Mk-2 on a four-year cycle.

Developers

Raytheon	San Diego, California
Technical support:	
Johns Hopkins University Applied Physics Laboratory	Laurel, Maryland
Naval Surface Warfare Centers	Dahlgren, Virginia Dam Neck, Virginia Port Hueneme, California

SPQ-9B Radar Anti-Ship Cruise Missile (ASCM)

Description

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 in a heavy-clutter environment. Its high-resolution track-while-scan, X-band, pulse-Doppler radar enables track detection at ranges that allow combat systems to engage subsonic or supersonic sea-skimming missiles at the outer edge of a ship's engagement envelop.

Status

SPQ-9B is an integral part of the cruiser modernization program, providing an ASCM cue to the Aegis Combat System. SPQ-9B integrates with SSDS Mk-2 on aircraft carriers and amphibious assault ships, enabling ASCM defense capabilities to pace the evolving worldwide threat. SPQ-9B is deployed in conjunction with SSDS Mk-2 and cruiser modernization.

Developers

Northrop Grumman	Baltimore, Maryland

SQQ-89 Anti-Submarine Warfare (ASW) Combat System

Description

The SQQ-89 ASW combat system suite provides cruisers and destroyers with an integrated undersea warfare detection, classification, display, and targeting capability. SQQ-89 is the Surface ASW "system of systems" that integrates sensors, weapons, and underwater self-defense capabilities. The Aegis Modernization Program

upgrades DDG 51 to DDG 78 and CG 59 to CG 73 ships with the AN/SQQ-89A(V)15. The A(V)15 Program of Record upgrades legacy systems on DDG 79 to DDG 112 and installs Multi-Function Towed Arrays (MFTA) on DDG 113-115.

AN/SQQ-89 A(V)15 is a modularized, Open Architecture (OA) system using COTS technology to provide revolutionary ASW warfighting improvements, and continuous upgrades to the following subsystems of the ASW "detect to engage" sequence:

- Multi-function towed array
- Continuous Active Sonar (CAS) and reduced false alarms algorithms
- ASW combat system interfaces for the Mk-54 digital torpedo and Mk-54 Vertical-Launch ASROC
- Echo tracker classifier (ETC) and active classification improvements
- Sonar performance and prediction algorithms and environmental models
- Computer-aided dead-reckoning table (CADRT) interfaces
- Torpedo Detection Classification and Localization
- Integrated, high-fidelity Surface ASW Synthetic Trainer (SAST)
- Synthetic Aperture Sonar and small object avoidance

AN/SQQ-89 A(V)15 provides revolutionary ASW warfighting improvements that include:

- Enhanced capability in the shallow water littoral environment
- Improved sensor performance for increased detection ranges
- Fire control algorithms for improved weapons performance

Status

The first A(V)15 install was completed in USS Mason (DDG 87) in September 2009. It included the addition of a Multi-Function Towed Array and marked the first towed array installation in a DDG Flight IIA warship. By the end of CY11 there will be 12 production A(V)15 systems installed. The Advanced Capability Build (ACB) process of providing software upgrades every two years and tech inserts on a four-year cycle provides the strategy for COTS obsolescence and future capability upgrades. The first ASW Advanced Capability Build (ACB) upgrade will field on USS Bulkeley (DDG 84) and will include SAST and major upgrades that improve surface ship ability to detect threat torpedoes. SAST is installed as part of the ACB 11 trainers at the Fleet ASW Training Center in San Diego, California and is planned for incorporation into the future design of the shore based ASW trainers.

Developers

Lockheed Martin	Syracuse, New York
Advanced Acoustic Concepts	Hauppauge, New York
Science Applications International Corporation	Arlington, Virginia

Surface Ship Torpedo Defense (SSTD)

Description

The SSTD system uses a layered approach and a family of systems acquisition strategy to provide softkill and hardkill capability.

- Softkill: AN/SQQ 25 ("Nixie") towed system and ADC Mk-2 Mod-4 countermeasures are currently deployed on cruisers and destroyers, amphibious ships, and high-value units (aircraft carriers and combat logistics force ships). The Nixie system is a towed acoustic and non-acoustic countermeasure, effective countermeasure protection against most threat torpedo types. ADC Mk-2 Mod-4 is a hand-deployed acoustic countermeasure used to defend surface ships from acoustic homing torpedoes.
- Hardkill: The Torpedo Warning System (TWS) detects, alerts, classifies, and localizes the target; and prepares launch solution, presets, and operator interface to launch Anti-Torpedo Torpedoes (ATT) to deliver a hardkill capability. The Countermeasure Anti-Torpedo (CAT) integrates the ATT with self-contained launch energetic in All Up Round Equipment (AURE) to defeat primary stern sector threat salvoes. Both TWS and CAT will be designed for ease of software upgrade.

Status

AN/SLQ-25C "Nixie" Countermeasure System is installed on all commissioned cruisers, destroyers, frigates, aircraft carriers, and amphibious warfare ships. Nixie is to be installed on Zumwalt-class (DDG 1000) ships but not on in-service mine warfare ship or the LCS variants.

- AN/SLQ-25C (equivalent to 25A with engineering changes through EC-16), installations will be completed in FY 2012 to improve reliability, acoustic countermeasure capability, provide a new littoral tow cable, and add enhanced non-acoustic improvements to counter threat torpedoes. The EC-16 upgrade was developed as a Joint U.S./UK SSTD program.
- AN/SLQ 25X includes a modular winch design, open architecture, shock hardening, a security upgrade, and a soft body Nixie replacement. Combat Logistics Force ships have 25-A systems that will be upgraded when replaced by 25-X.

ATTDS is being developed for high value units (CVN and CLF ships) and will IOC in 2018. Six Engineering and Development Model (EDM) systems are programmed with two CVN installations planned per year during FY 2014, FY 2015, and FY 2016. TWS Prototype systems will be installed with ten CATs each. TWS achieved milestone B, pending CDD signature upon completion of Joint Review by February 2012. Milestone C will be requested in 2014 and Low Rate Initial Production (LRIP) is scheduled for FY 2015. CAT will also seek Milestone C approval to enter System Development and Demonstration (SD&D) in FY 2014 and LRIP delivery beginning in FY 2015.

Developers

Anti-Torpedo Torpedo:
Penn State Applied
Research Laboratory — State College, Pennsylvania

Torpedo Warning System:	
Alion Science and Technology	New London, Connecticut
	Phoenix, Arizona
	Fairfax, Virginia
Ultra Electronics	Braintree, Massachusetts
SLQ-25:	
Argon ST	Smithfield, Pennsylvania

Tactical Tomahawk Weapon Control System (TTWCS)

Description

The TTWCS Viability Build is the next significant upgrade to the in-service Tactical Tomahawk Weapons Control System. TTWCS initializes, prepares, and launches Block III and Block IV Tomahawk Land Attack Missiles (TLAMs). TTWCS also provides capability for firing units to plan Block III and Block IV GPS-only missions, retarget Block IV missiles to alternate targets, and monitor missiles in flight. The initial release of TTWCS reduced equipment racks required on board surface ships, introduced common software for the various Tomahawk-capable platforms (U.S. DDG, CG, SSN, SSGN, and U.K. SSN), and reduced overall reaction and engagement planning timelines. The Viability Build eliminates obsolete hardware and software, eliminates redundant functionality in favor of already existing TC2S functionality, maintains interoperability with evolving systems, and modernizes interfaces in accordance with joint mandates (Service Oriented Architecture and Internet Protocol Version 6). The Viability Build also improves operator interaction with the system and provides an integrated training capability at all levels TTWCS Viability Build builds on the TTWCS system architecture to maintain existing Tomahawk Weapons System (TWS) functionality, provides for future growth, and enhances command-and-control interoperability.

Status

TTWCS V5 incorporates Tomahawk Integrated Training Architecture, changes for Cruiser Modernization, and the addition of Ohio-class SSGN and Seawolf and Virginia-class SSN submarines. The next software build of the weapons system is TTWCS Viability Build, which will improve C4I interoperability, update computer hardware and performance, and align TTWCS with DoD mandates.

Developers

Naval Surface Warfare Center	Dahlgren, Virginia
Lockheed Martin	Valley Forge, Pennsylvania
Naval Undersea Warfare Center, Keyport	Newport, Rhode Island
Southeastern Computers Consultants Inc.	Austin, Texas

Tomahawk Command and Control System (TC2S)

Description

The Program of Record is Theater Mission Planning Center (TMPC), the mission planning and execution segment of the Tomahawk Weapon System (TWS). Under the umbrella of the TMPC, the Tomahawk Command and Control System (TC2S) provides subsystems for precision targeting, route planning, mission distribution, and strike management for TLAM missions. TMPC optimizes all aspects of the Tomahawk missile mission to engage a target successfully. TC2S develops and distributes missions for the Tomahawk Missile; provides command information services for TWS; provides strike planning, execution, coordination, control, and reporting; and provides Maritime Component Commanders (MCC) the capability to plan or modify conventional TLAM missions. TC2S has evolved into scalable configurations deployed in five configurations at 177 sites: Cruise Missile Support Activities (3); Tomahawk Strike Mission Planning Cells (3 at FIFTH, SIXTH, and SEVENTH Fleets); Carrier Strike Groups (10); Firing Units (133); Command & Control Nodes (11); Labs (5); and Training Classrooms (6). TC2S and/or its components are employed by the United Kingdom under two separate Foreign Military Sales cases (TLAM and Storm Shadow). TC2S allows planners to exploit the full capabilities Tomahawk either in deliberate planning conditions or for battlefield time-sensitive planning operations, including executing all post-launch missile-control operations.

Status

The latest fielded version, TC2S 4.2.2, incorporated new national sensor capabilities. The planned IOC of TC2S 4.3 in June 2012 will improve system usability and complete the migration of the Precision Targeting Workstation's functionality to the service-oriented architecture based Targeting and Navigation Toolset, permitting the retirement of PTW. All Tomahawk missiles fired operationally from *Operation Desert Storm* through *Operation Odyssey Dawn* have been planned and executed with TC2S components.

Developers

COMGLOBAL	San Jose, California
Boeing	St. Louis, Missouri
BAE Systems	San Diego, California
SAIC	McLean, Virginia

SURFACE EQUIPMENT AND TRAINING SYSTEMS

Battle Force Tactical Trainer (BFTT)

Description

BFTT integrates the family of embedded combat system trainers, providing aircraft carriers, cruisers, destroyers, and amphibious ships the capability to maintain readiness requirements across multiple warfare areas. These areas include air defense, electronic warfare, anti-submarine warfare, and integrated air and ballistic missile defense.

Status

BFTT began full-rate production following operational testing in 1997. It is fielded in all CVN 68, CG 47, DDG 51, LSD 41/49,

and LPD 17-class ships. BFTT achieved IOC in 1999 and continues with fleet upgrades through 2015. The BFTT system is the combat system scenario generator on surface combatants and is undergoing modernization to improve ship training system reliability network interfaces to meet Navy Continuous Training Environment (NCTE) requirements. This includes development of an integrated Total Ship Training Capability (TSTC) aligned with Advanced Capability Build (ACB) deliveries.

In addition to modernizing the BFTT system, the T46D variant will be the key enabler permitting integration of anti-submarine warfare, navigation, and engineering embedded trainers in a first step toward fielding a Total Ship Training Capability (TSTC).

BFTT systems and associated interfaces maximize limited underway days and support unit and integrated synthetic training requirements as delineated in the Commander, U.S. Fleet Forces Command Fleet Training Continuum (FTC) and Commander Naval Surface Forces Surface Force Training Manual (SFTM).

Developers

Naval Surface Warfare Center	Dam Neck, Virginia
Lockheed Martin	Chesapeake, Virginia
SYS Technologies	San Diego, California
NOVONICS	Arlington, Virginia
Electronic Warfare Associates	Chantilly, Virginia
L-3/Unidyne	Norfolk, Virginia
AAI Corp	Timonium, Maryland
AP Labs	San Diego, California
Tri Star	Chesapeake, Virginia
SAIC	San Diego, California
WR Systems	Fairfax, Virginia
DRS	Parsippany, New Jersey

Chemical, Biological, Radiological and Nuclear Defense - Individual Protection Equipment - Readiness Improvement Program (CBRND - IPE - RIP)

Description

The Individual Protective Equipment (IPE) Readiness Improvement Program (RIP) for forces afloat manages millions of individual pieces of equipment for Sailors deploying into potential chemical, biological, and radiological (CBR) threat environments. Through centralized management, this program ensures afloat and deployed expeditionary Sailors are always provided with correctly maintained and properly fitted individual protection ensembles and a chemical protective mask, ready for immediate retrieval in response to the dictated Mission Oriented Protective Posture (MOPP) condition. Historically, the maintenance and logistics functions required maintaining material readiness of this equipment necessitated an extraordinary number of organizational man-hours that could be better-used supporting operations and training. Ninety-day pre-deployment readiness visits by the NAVSEA "RIP Team" relieve the ships of this burden. The cornerstone of the RIP is the NAVSEA Consolidated Storage Facility (CSF) located at Ft. Worth, Texas.

Status

This program continues to improve Fleet CBR readiness. In addition to IPE and gas masks, the Readiness Improvement Program manages Interceptor Body Armor (IBA), Dorsal Auxiliary Protective Systems (DAPS), and Light Weight Helmets (LWHs) for expeditionary forces; provides protective CBR equipment to Navy's Individual Augmentees as they process through designated Army Training Centers; manages CBRND IPE for the Military Sealift Command (MSC); and manages Navy's afloat Anti-Terrorism/Force Protection (AT/FP) equipment.

Developers

Naval Surface Warfare Center, Panama City	Panama City, Florida
Battelle Memorial Institute	Columbus, Ohio
Gryphon Technologies LC	Greenbelt, Maryland
General Dynamics-IT	Fairfax, Virginia

Shipboard Collective Protection System (CPS)

Description

CPS provides a protective environment from chemical, biological, and radiological (CBR) threats, thus permitting personnel to perform their mission-essential operations without the need for individual protective equipment. The system over-pressurizes specified ship spaces with air filtered through an array of housings that contain multiple CBR filter sets preventing the ingress of CBR contaminants. Zone ingress and egress is facilitated through supporting systems including air locks, pressure locks, and decontamination stations located on the zone boundaries to maintain the integrity of clean spaces. Integrated into the heating ventilation and air conditioning (HVAC) systems, shipboard CPS provides continuous protection to personnel and equipment within the zone boundary. On those ships where it is not feasible to provide protection to the entire ship, mission-essential spaces such as medical, command and control, and rest and relief areas are outfitted with CPS.

Status

CPS coverage varies by ship class and ranges from the entire ship interior (DDG 51 FLT I, DDG 51 FLT II, and T-AOE-6 classes) to zone-specific coverage systems (DDG 51 FLT IIA, LSD, LPD 17, LHD, LHA classes). These systems are a combination of new construction and back-fit installations, depending on the ship. 100 ships are projected to have CPS by FY 2014. In response to lessons from Operation Tomodachi, the humanitarian/crisis response to Japan's 2011 earthquake and tsunami, the Navy has established a stockpile reserve inventory of CPS filters to maintain a degree of readiness and to support emergent surges in fleet CPS filter change-out demand.

Developers

Naval Surface Warfare Center	Dahlgren, Virginia

SECTION 3
SUBMARINE FORCE

The submarine force, the Navy's "silent service," contributes significantly to many of the Navy's core capabilities. The concealment provided by the sea enables U.S. submarines to conduct undetected and non-provocative operations, to be survivable, and to attack both land and sea targets. Nuclear-powered attack submarines (SSNs) enable sea control, providing unseen surveillance of far-flung regions of ocean along with the ability to attack and sink hostile surface ships and submarines. The power-projection capabilities of nuclear-powered guided-missile submarines (SSGNs) include precision strike from land-attack cruise missiles and insertion of Special Operations Forces (SOF) to conduct reconnaissance and direct-action missions in hostile environments. The Navy's fleet of nuclear-powered ballistic missile submarines (SSBNs) provides the ability to conduct nuclear offensive strike, contributing to the core capability of deterrence at the national strategic level.

SUBMARINES AND UNDERSEA VEHICLES

Ohio-Class Replacement (OR) Fleet Ballistic-Missile Submarine

Description

The fleet ballistic-missile submarine (SSBN) will continue to provide the backbone of the Nation's survivable nuclear deterrent force. Starting in 2027, the oldest Ohio (SSBN 726)-class SSBN will reach the end of its strategic service, and Ohio-class SSBNs will continue to retire at a rate of about one hull per year. The Navy intends to replace the Ohio-class submarines with a new follow-on SSBN, with strategic nuclear deterrence as its sole mission. The initial payload will be the Trident II/D5 Life Extension (D5LE) submarine-launched ballistic missile (SLBM). The associated missile systems will be developed jointly with the United Kingdom, continuing the long-standing SSBN partnership between the U.S. Navy and the Royal Navy.

Concurrent to the Ohio-Class Replacement, the United Kingdom will recapitalize its sea-based strategic deterrent platforms, the Vanguard-class SSBN, which also hosts the Trident II/D5LE SLBM. Under cost-sharing agreements, the United States and United Kingdom jointly develop common missile compartment components to reduce design and construction costs.

Design and construction experience from the successful Virginia (SSN 774)-class submarine program demonstrate that early and robust investment in design leads to more developed and mature technology and platform specifications prior to construction start. A mature design at the beginning of construction results in cost savings and better adherence to the scheduled build duration.

Status

An Analysis of Alternatives (AoA) for the Sea-Based Strategic Deterrent (SBSD) was completed and approved in 2009. Defense Acquisition Milestone A was approved in January 2011 and the program entered the technology development phase. The service-approved Ohio-Class Replacement Capabilities Development Document (CDD) was completed in December 2011 to guide the technology development efforts. Early research and design efforts include prototyping and construction technique demonstration for the first new-design SLBM tubes built since the delivery of USS Louisiana (SSBN 743) in 1997.

Developers

General Dynamics Electric Boat Corporation	Groton, Connecticut
Huntington Ingalls Industries Newport News	Newport News, Virginia

SSN 774 Virginia-Class Nuclear-Powered Attack Submarine

Description

The Virginia-class submarine is specifically designed for multi-mission operations in the littorals while retaining the submarine force's strength in traditional open-ocean anti-submarine and anti-surface missions. These submarines have advanced acoustic stealth technology that allows unimpeded operation within an adversary's defensive perimeter. Using this asymmetric access, Virginia-class submarines are configured to conduct sea-control, land attack, mine reconnaissance, Special Operations Forces (SOF) insertion/extraction, intelligence collection, and surveillance missions that enable successful access and follow-on operations by larger general-purpose forces. The Virginia-class can serve as host for various SOF delivery methods, including mini-submersibles and raiding craft via an embarked dry-deck shelter or directly to sea via integral lock-out chambers.

The submarines are built using a modular construction process that allows construction, assembly, and testing of systems prior to installation in the hull, thereby reducing costs, minimizing rework, and simplifying system integration. The modular design and extensive use of open architecture electronics systems facilitates technology insertion in both future ships during new-construction and ships in the fleet, enabling each Virginia-class submarine to keep pace with emerging threat capabilities throughout its 33-year service life.

Virginia-class submarines are built under an innovative teaming arrangement between General Dynamics Electric Boat (GDEB) and Huntington Ingalls Industries (HII) Newport News. Using a modular construction process, each shipyard builds portions of each ship with integration and delivery of completed submarines alternating between the shipyards.

Status

In 2008, the Navy negotiated the current multi-year procurement contract for a total of eight submarines between 2009 and 2013. In 2010, the Virginia-class program completed Milestone III review, receiving Full Rate Production authority and achieving Full Operational Capability (FOC). In 2011, the Navy increased the procurement rate to two submarines per year, the first time the Navy procured two submarines in the same year since 1991. USS California (SSN 781), the eighth Virginia-class submarine, delivered in August 2011 and continued the Virginia-class trend of constructing submarines under contracted time and budget. The Navy will initiate efforts for the research, development, and design of the Virginia Payload Module (VPM) for future strike capacity with Tactical Tomahawks (TACTOM) and follow-on weapons.

Developers

General Dynamics' Electric Boat Corporation	Groton, Connecticut
Huntington Ingalls Industries Newport News	Newport News, Virginia

Submarine Rescue Chamber / Diving and Recompression System (SRC / SRDRS)

Description

The Navy's legacy Deep Submergence Rescue Vehicles (DSRVs) have been replaced by the new Submarine Rescue Diving and Recompression System (SRDRS), which, along with the existing Submarine Rescue Chambers (SRCs), provides the nation's capability for submarine rescue. These systems can be quickly deployed in the event of a submarine accident. They are transportable by truck, aircraft, and ship. The SRDRS consists of three distinct systems: (1) Assessment Underwater Work System (AUWS); (2) Pressurized Rescue Module System (PRMS); and (3) Surface Decompression System (SDS). AUWS provides the Atmospheric Diving System (ADS2000), a one-atmosphere, no-decompression manned diving system capable of depths to 2,000 feet for the main purpose of clearing and preparing a submarine hatch for seating a rescue platform. The PRMS provides a manned, tethered, remotely piloted vehicle capable of rescuing personnel from a stricken submarine to depths of 2,000 feet. The SDS overcomes a significant deficiency of older systems by enabling personnel "transfer under pressure" for surface decompression following rescue from a pressurized submarine environment. The SRDRS is a government-owned, contractor-operated system, capable of rapid, worldwide deployment and mobilization on vessels of opportunity.

Status

ADS2000 completed operational test and evaluation and was introduced to the Fleet in September 2007. Four ADS2000 suits are maintained at the Navy's Deep Submergence Unit. PRMS was delivered in late 2008 at which time the DSRV program was retired. Development of the SDS "transfer under pressure" capability is ongoing and planned to be introduced in FY 2013 with and IOC in 2015. SRC is programmed for continued service to the Fleet.

Developers

OceanWorks International	Vancouver, California
Oceaneering International	Upper Marlboro, Maryland
Southwest Research Institute	San Antonio, Texas
Caley Ocean Systems	Glasgow, Scotland
Environmental Tectonics Corporation	Southampton, Pennsylvania

SUBMARINE WEAPONS

Mk-48 Advanced Capability (ADCAP) Common Broadband Advanced Sonar System (CBASS) Torpedo

Description

The Mk-48 Advanced Capability (ADCAP) heavyweight torpedo is the Navy's sole submarine-launched weapon for anti-submarine (ASW) and anti-surface warfare (ASuW). The ADCAP torpedo was authorized for full-rate production in 1990 and the final production all-up-round torpedo was delivered to the U.S. Navy in 1996. Since then, the Navy has employed an open-architecture

model to provide software and hardware improvements to the existing ADCAP torpedo inventory.

The ADCAP torpedo features sophisticated sonar, all-digital guidance and control systems, digital fusing systems, and improved torpedo acoustic stealth compared to the legacy Mk-48 torpedo. The Mod-7 Common Broadband Advanced Sonar System (CBASS) is an incremental improvement, which includes a new broadband sonar system, for shallow-water performance enhancement.

The CBASS upgrade to the ADCAP torpedo is part of an ongoing Armaments Cooperative Program with the Royal Australian Navy (RAN). In addition to the RAN, the Canadian and Dutch navies also employ versions of the Mk-48 torpedo through the Navy's Foreign Military Sales program.

Status

Phase I (of II) of the CBASS program, with the new Broadband Sonar Analog Receiver (BSAR), achieved Initial Operating Capability and was introduced to the Fleet in 2006. Phase II of the CBASS program, with Advanced Processor Build (APB) Spiral 4 software improvements, was released to the Fleet through the Navy's Quick Reaction Assessment process in March 2011 in response to emerging needs.

The Navy continues to procure CBASS hardware for eventual conversion of all ADCAP torpedoes through the life of the program. In parallel, the spiral development program continues to improve torpedo performance through software upgrades in challenging areas, such as the shallow-water diesel submarine threat. The Phase II Spiral 4 torpedo continues through operational testing for which it is expected to achieve Full Operational Capability in the fourth quarter FY 2012. The Mk-48 ADCAP is and will remain the Navy's primary submarine-launched torpedo through 2026.

Developers

Lockheed Martin Sippican — Marion, Massachusetts

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

Description

The Trident II/D5 is the sixth generation of the Navy's Fleet Ballistic Missile (FBM) program, which started in 1955. The D5 is a three-stage, solid propellant, inertial-guided SLBM with a range greater than 4,000 nautical miles and accuracy measured in hundreds of feet. Trident II missiles are carried by all 14 Ohio (SSBN 726)-class SSBNs, each of which carry 24 SLBMs. The New Strategic Arms Reduction Treaty of 2010 limits the numbers of delivery vehicles and warheads on all strategic systems including TRIDENT II and is to be implemented within seven years. 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.

Navy has embarked on a Life Extension Program (D5LE), which will upgrade missile systems and maintain D5 in the fleet into the 2040s, bridging the transition from Ohio-class SSBNs to Ohio Replacement SSBNs. The initial payload of the Ohio Replacement SSBN will be the Trident II/D5 D5LESLBM.

Status

Full missile procurement began in FY 2008 ending in FY 2012, with a total acquisition of 108 additional missiles. Additionally, life extension kits and replacement solid rocket motors are procured throughout and beyond the future years defense program to refurbish obsolete electronics and expiring rocket motors on existing missiles.

Developers

Lockheed Martin — Sunnyvale, California

SUBMARINE SENSORS

BQQ-10 Acoustic Rapid COTS Insertion (ARCI)

Description

ARCI replaces existing legacy submarine sonar systems on all submarine classes with a more capable and flexible commercial off-the-shelf (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. COTS/OSA technologies and systems enable biannual updates to both software and hardware with little or no impact to submarine scheduling. COTS-based processors allow computer power growth at a rate commensurate with that of commercial industry. Additionally, the open architecture design of the ARCI system allows for the rapid insertion of new sensor systems and processing techniques at minimal cost. New sensor systems, such as the Low-Cost Conformal Array (LCCA) and upgraded Fat Line Towed Array (TB-34), are currently being integrated in the ARCI system.

Status

BQQ-10 ARCI is the upgrade to legacy (BSY-1 and prior) sonar systems. Submarines receive periodic improvements through Technology Insertions (TIs) of hardware and Advanced Processor Builds (APBs) of software. While TI upgrades are designed for insertion biannually (on the even years: TI08, TI10, TI12, etc.), individual submarines typically receive a TI every other cycle. This nominal four-year refresh of hardware keeps each submarine's processing power in line with the state of the computing industry while ensuring that the COTS components are upgraded before commercial obsolescence. Biannual APBs (on the odd years: APB07, APB09, APB11, etc.) allow for rapid insertion of improved acoustic processing algorithms and increased capabilities requested by the type commanders to address emerging challenges. ARCI is now on a common TI/APB cycle with combat control and imaging. Navy Research, Development, Testing, and Evaluation (RDT&E) will continue to develop processing algorithms from

the surveillance, tactical and advanced R&D communities as well as perform laboratory and at-sea testing.

Developers

Applied Research Lab, University of Texas at Austin	Austin, Texas
General Dynamics Advanced Information Systems	Fairfax, Virginia
Lockheed Martin	Manassas ,Virginia
Progeny Systems Corporation	Manassas, Virginia
SEDNA Digital Systems	Manassas, Virginia

SUBMARINE EQUIPMENT AND SYSTEMS

BYG-1 Submarine Combat Control System

Description

BYG-1 is the common submarine combat control system across all submarine platforms except Ohio-class (SSBN 726) fleet ballistic-missile submarines. BYG-1 is a commercial off-the-shelf (COTS), open systems architecture (OSA) system that incorporates organic sensor fusion, target solution development, combined tactical picture, weapon control, and Tactical Local Area Network (TacLAN) functions into a single procurement program. The use of COTS/OSA technologies and systems enables frequent periodic updates to both software and hardware with little or no impact on submarine scheduling. COTS-based processors allow Navy computer power growth at a rate commensurate with that of commercial industry. Additionally, the open architecture design of the BYG-1 system enables the rapid integration of new sensors and processing techniques at minimal cost. BYG-1 allows the submarine force to update rapidly the ship safety tactical picture, integrates the common tactical picture into the battle group, improves torpedo interfaces, and provides Tactical Tomahawk capability.

Photo courtesy of MSNBC.

Status

BYG-1 is scheduled to be installed on all attack (SSN) and guided missile (SSGN) submarines by FY 2013. Submarines already upgraded receive periodic improvements through technical insertions (TI) of hardware and advanced processor builds (APB) of software. While TI upgrades are designed for insertion biannually, individual submarines normally receive a TI every-other cycle. This nominal four-year refresh of hardware keeps each submarine's processing power on pace with the state of the computing industry while ensuring that the COTS components are upgraded before commercial obsolescence. Biannual APBs allow for rapid insertion of improved processing algorithms and increased capabilities requested by Navy type commanders to address emerging challenges. Navy research, development, testing, 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.

Developers

General Dynamics Advanced Information Systems	Pittsfield, Massachusetts Fairlakes, Virginia
Progeny	Manassas, Virginia
Lockheed Martin	Eagan, Minnesota
John Hopkins University Applied Physics Laboratory	Laurel, Maryland

Submarine Escape (SEIE)

Description

Submarine Escape and Immersion Equipment (SEIE) allows submariners to escape from a stricken submarine at depths down to 600 feet in self-contained immersion suits with integral rafts and safety equipment. All submarines are being outfitted with the Mk-10 SEIE suits, improved air-delivery systems, and improved hatch-operating systems. In addition to provide thermal protection and an integral life raft, these suits allow for escape at greater depth than the older "STEINKE" system that they have replaced.

Status

Installation is complete for the submarines of the Los Angeles (SSN 688I), Seawolf (SSN 21), and Ohio (SSBN/SSGN) classes. Virginia (SSN 774)-class submarines are receiving SEIE suits upon initial outfitting following construction.

Developers

RFD Beaufort Survitec Defence and Aerospace	Birkenhead, United Kingdom
Electric Boat	Groton, Connecticut
Hale Hamilton Ltd.	Uxbridge, United Kingdom

Submarine Survivability

Description

Today's submariners use passive means to remove carbon dioxide from a disabled submarine's atmosphere, enabling survival up to seven days. Current developments include improving the passive scrubbing capabilities by the introduction of new Lithium Hydroxide (LiOH) canisters.

Status

Installation of passive scrubbing curtains onboard all in-service submarines is complete. Newly developed flat-sheet LiOH canisters are being phased into the initial outfitting for Virginia (SSN 774) class new-construction.

Developers

Battelle Memorial Institute	Columbus, Ohio
Analox Sensor Technology Ltd	Stokesley, United Kingdom
Micropore, Inc.	Newark, Delaware

SECTION 4
EXPEDITIONARY FORCES

The Navy's expeditionary forces carry out a wide range of responsibilities and provide a robust set of capabilities. The Navy's vast and geographically dispersed logistics network, including its fleet of amphibious ships—LHA, LHD, LSD, and LPD—enable Navy and Marine Corps forces to sustain forward presence, exert sea control over large areas, and project power ashore. These survivable ships, equipped with aviation and surface-assault capabilities, rapidly close, decisively employ, and sustain Marines from the sea. Their capacity to provide equipment and supplies ashore enables them to respond quickly to world crises. Riverine and expeditionary security forces provide maritime security in coastal and inland waterways, protecting ships and maritime infrastructure. In addition, Joint High-Speed Vessels (JHSVs), hospital ships (T-AHs), and Mobile Construction Battalions (Seabees) provide humanitarian assistance, disaster relief, and build partner-nation capacity.

EXPEDITIONARY FORCES

Explosive Ordnance Disposal / Mobile Diving and Salvage

Description

The Explosive Ordnance Disposal (EOD) Community is operationally organized into two deploying EOD Groups, each headed by a Navy captain. Each Group has several EOD Mobile Units, a Mobile Diving and Salvage Unit (MDSU), a Training Unit, and an Expeditionary Support Unit assigned. EOD Units are tasked with providing the Fleet, other services and the interagency community with the capability to detect, identify, render safe, recover, evaluate, and dispose of ordnance that has been fired, dropped, launched, projected or placed in such a manner as to constitute a hazard to operations, installations, people, or material. Commonly operating in platoons and smaller elements, these EOD units assure access to battlespace, by opening lines of communication in the sea-to-shore interface as well as blue-water and land-based operations. Their missions eliminate hazards that jeopardize operations supporting the National Military Strategy. This can require diving operations, parachute insertion, or helicopter insertion. These mobility skills, along with responsibility for all underwater ordnance, make Navy EOD unique in the joint force. The Secretary of the Navy is the Single Manager for EOD Technology and Training, carrying out these duties primarily through The Navy EOD Technology Center and the Naval School Explosive Ordnance Disposal, where all U.S. and select foreign-partner military EOD technicians receive the same initial training to defeat conventional land and air ordnance as well as improvised explosive devices (IED). Navy EOD also has capabilities with regard to chemical, biological, radiological, nuclear and enhanced-explosive weapons and terrorist "dirty" bombs.

Mobile Diving and Salvage Units conduct operations as a commander task group/unit (CTG/CTU) to plan, coordinate, and direct combat harbor-clearance, anti-terrorism and force protection (ATFP) diving missions, salvage and recovery operations, and other assigned mission areas in direct support of naval, joint, or combined task force, operating afloat or ashore during combat or national emergencies in climate extremes—arctic, tropical, or desert environments. They conduct afloat and ashore expeditionary salvage, search, and recovery operations. They also perform harbor clearance to remove obstructions restricting access to ports, piers, and waterways, assist vessels in distress, de-beaching and salvage ships and aircraft, locate and recover other objects of value, underwater cutting and welding, limited underwater ship repair, ship husbandry and anti-terrorist/force protection dive support for both ships in port, and port facilities.

Status
Both EOD and MDSU are recapitalizing their authorized equipment inventories with new Tables of Allowance (TOA) approved in 2008. Based on a complete review of their mission requirements, each TOA is being realigned with their force structures and standardized, where possible, across the Navy Expeditionary Combat Enterprise. Specialty equipment—e.g., man-transportable robotic systems, unmanned underwater vehicles, and Mk-16 underwater breathing apparatus—were included for EOD units.

Maritime Civil Affairs and Security Training (MCAST) Command

Description
Maritime Civil Affairs and Security Training Command is a "soft power" enabling force that works within a combatant commander's area of operations to promote regional security and stability. MCAST delivers critical maritime civil affairs (MCA) and security force assistance (SFA) capabilities by providing increased U.S. presence in the near-coast, littoral environment to enhance engagement and deter the root causes of instability. The MCAST mission is to assess, plan, and evaluate civil/military affairs activities in the maritime environment. Its areas of expertise include traditional civil affairs functional areas such as public education and public health, but it is regionally aligned and focused on three maritime-specific functions: commercial port operations; harbor and channel construction and maintenance; and marine and fisheries resources. It also assists with planning and coordination for U.S. country teams, non-combatant evacuation operations, refugee operations, host-nation interagency support, and restoration of communications and local infrastructures following military operations or natural disasters.

Maritime Civil Affairs Teams (MCATs) work directly with civil authorities and local populations to lessen the impact of military operations imposed during peacetime, contingency operations, and war. Mobile Training Teams (MTTs) deliver timely, focused, and customized military-to-military training to partner countries, in the host nation's language. MCATs and MTTs are specially trained with cultural and language skills for a specific region.

MCAST Command is located in Dam Neck, Virginia.

Status
The MCAST TOA contains the equipment necessary for MCATs and MTTs to deploy in support of field operations.

Maritime Expeditionary Security Force (MESF)

Description

Maritime Expeditionary Security Force supplies highly trained, scalable, and sustainable security teams capable of defending mission-critical assets in the near-coast, littoral environment. MESF units provide worldwide maritime and in-shore surveillance, security, and anti-terrorism force protection (ATFP), ground defense, afloat defense, airfield/aircraft security, and a wide range of secondary tasks from detention operations to law enforcement.

Status

The MESF TOA is under review in early 2012 to address the implication of changes in force structure to equip properly the force for expeditionary security requirements in peacetime, contingency, and major combat operations.

Naval Mobile Construction Battalion (NMCB) "Seabee"

Description

Naval Construction Force elements provide engineering and combat construction support to Marine Air-Ground Task Force (MAGTF), Navy commanders, and other joint forces and combatant commanders. 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 "Seabees" enables the surge of task-tailored engineer forces and equipment sets to enhance the MAGTF and other naval and joint forces on land. In operations other than war, forward-deployed NMCBs hone construction skills through humanitarian assistance and disaster-recovery operations; participate in foreign engagement exercises; and complete construction projects that support sustainment, restoration, and modernization of the Navy and Marine Corps' forward bases and facilities.

Status

The Navy has developed a long-range plan to recapitalize the tables of allowance of all Seabee units. The initial priority is to correct existing inventory deficiencies and replace aging tools and equipment that are no longer parts supportable. During the next several years, NMCB TOAs will be outfitted with modern and recapitalized tactical vehicles, construction and maintenance equipment, communications gear, infantry items, and field support equipment.

Naval Special Warfare

Description

The Naval Special Warfare (NSW) community is the Maritime Component of the U.S. Special Operations Command (USSOCOM) and the Special Operations Component of the Navy: Navy Sea, Air, Land (SEAL) forces. The Commander, Naval Special Warfare Command is responsible for strategic vision; doctrinal, operational, and tactical guidance; and training, organizing, and equipping operational support components of the community.

NSW forces provide a highly effective option across the spectrum of hostilities, from peacetime operations to limited and general war. They focus on the conduct of the principal mission areas of special operations: counter-terrorism; counter-proliferation; unconventional warfare; direct action; special reconnaissance; military information support operations; and security force assistance and civil affairs. NSW forces also conduct collateral missions such as counter-drug activities, humanitarian assistance, and personnel recovery.

The NSW community is organized under seven major commands, which include five operational commands, one training command, one tactics and technology development command, and one Reserve Component (RC) command. The major operational components of NSW are Naval Special Warfare Groups (NSWGs) ONE, THREE, and ELEVEN in San Diego, California; and NSWGs TWO, FOUR, and TEN in Little Creek, Virginia. The NSWG mission is to equip, support, and provide command and control elements as well as trained and ready SEAL platoons/troops, SEAL delivery vehicle (SDV) platoons, Special Boat Teams (SBT) combatant craft detachments, and other forces to the combatant commanders. Two of the NSWGs also provide administrative control to a total of four NSW units and one detachment that are home ported forward, and are under operational control of a theater Special Operations Command.

The primary deployable operational component of the community is the NSW Squadron (NSWRON). A NSWRON is a task-organized unit centered on a SEAL Team and led by a SEAL Team commanding officer. When a NSWRON is provisionally established, the deploying SEAL Team will normally be augmented by a combatant craft detachment; a support activity troop; an EOD platoon; communications, intelligence, tactical cryptological support detachments; Navy Seabees; and personnel or other detachments tailored for specific missions.

Status

Resources to support the NSW community are principally provided by USSOCOM, but the Navy retains resourcing of responsibilities for service common capabilities.

Navy Expeditionary Logistics Support Group (NAVELSG)

Description

The Navy Expeditionary Logistics Support Group (NAVELSG) consists of Navy Expeditionary Logistics Regiments (NELRs), Navy Cargo Handling Battalions (NCHBs), a Training and Evaluation Unit (TEU), and an Expeditionary Support Unit (ESU). The NELRs and NCHBs are capable of rapid, worldwide deployment and are trained and equipped to provide shore-based logistical support to Navy, Marine Corps, and joint force commanders. NCHBs can assume control of pier and terminal operations, surface or air cargo handling, and ordnance handling and management. Specialized capabilities include expeditionary fuel operations, pier and air terminal operations, cargo processing (to include bulk mail), heavy lift crane operations, short-haul trucking, and expeditionary warehousing.

Status

The ELSG TOA was approved March 2010.

Riverine Forces

Description

Formally established in May 2006, Riverine Group ONE, a component of the Navy Expeditionary Combat Command (NECC), located at Joint Expeditionary Base (JEB) Little Creek, Virginia, has three component Riverine Squadrons (RIVRONs): RIVRONs ONE and TWO are home ported at JEB Little Creek, Virginia; and RIVRON THREE is home ported in Yorktown, Virginia. Riverine Squadron operations can ensure the continuance of legitimate trade, keep open lines of communication (LOCs), establish and maintain control of rivers and other inland waterways for military and civil purposes, deny the use of these LOCs to hostile forces and engage waterborne hostile forces as necessary. Riverine Squadrons can support operations to counter sea- and ashore-based terrorism and other illegal activities that include hijacking, piracy, and human trafficking. They also conduct shaping and stability operations and train coalition partners in riverine operations, tactics, techniques, and procedures. Each Riverine Squadron operates three types of combatant craft: the riverine command boat, the riverine patrol boat, and the riverine assault boat.

Since early in calendar year 2007 and through 2011, all three Riverine Squadrons have been deployed several times to Iraq.

Status

The TOA for the three baseline Riverine Squadrons has been 100 percent resourced and initial outfitting is complete. Introduction of capability improvements and recapitalization of major equipments are contemplated for the future. A fourth Riverine Squadron focused on security force assistance training will be commissioned in FY 2012.

EXPEDITIONARY AND SPECIAL MISSION SHIPS AND CRAFT

Landing Craft, Air Cushion (LCAC)

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 shores as compared with 17 percent for conventional landing craft. LCACs deliver vehicles and cargo directly onto dry land rather than in the surf zone, and have proved invaluable in support of humanitarian assistance/disaster relief (HA/DR) missions including Tsunami Relief, Hurricane Katrina, and *Operation Unified Response* in Haiti. LCACs are multi-mission craft that can 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 72 LCACs will be accomplished through FY 2017. Additionally, some of the craft have been outfitted with radar and radio systems upgrades prior to entry into SLEP. As part of the LCAC SLEP, the Navy will incorporate the following life enhancements:

- 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, that will be fully interoperable with in-service and near-term future joint systems
- Engine upgrades (ETF-40B configuration) that will provide additional power and lift, particularly in hot (100° Fahrenheit and higher) environments, reduce fuel consumption, reduce maintenance needs, and reduce lift footprint
- Refurbishment of the buoyancy box and some of the rotating machinery in order 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

Status

LCAC IOC was achieved in 1986. Contracts for 91 LCACs were approved through FY 1997, with all 91 craft delivered by the end of 2001. Nine that were in deep reduced operating status (03ROS)

were terminated in FY 2006 for cost reasons, and two LCACs are dedicated R&D craft. The LCAC SLEP began in late 2000. Four to six SLEPs are planned each year FY 2006-FY 2016.

Developers

Textron Marine and Land Systems	New Orleans, Louisiana
Avondale Marine	Gulfport, Mississippi
Gryphon Technologies LC	Panama City, Florida

Ship To Shore Connector (SSC) / LCAC 100

Description

The SSC is envisioned to provide high-speed, heavy-lift for over-the-horizon maneuver, surface lift, and shipping. The SSC is addressing the gap in heavy sea-to-shore lift that will emerge as the upgraded in-service LCACs reach their end of service lives (LCAC SLEP) and retire beginning in 2014. The SSC payload design will exceed the legacy LCAC payload. The SSC will also target reduced manning requirements and the use of enhanced lift fans, propellers, and composite materials.

Status

The Joint Requirements Oversight Council approved the Initial Capabilities Document in October 2006. An analysis of alternatives was approved in early FY 2008, and the Capability Development Document was approved in June 2010. Initial operating capability is scheduled for 2020. Source selection is in progress, with an expected contract award in FY 2012.

Developers

To be determined.

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

Description

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) 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 element of joint, interagency, and multinational maritime expeditionary forces. The first LHA replacement is being designed as a variant of Makin Island (LHD 8). This ship will include LHD 8 enhancements (a gas turbine propulsion plant and all-electric auxiliaries) and a significant increase in aviation lift, sustainment, and maintenance capabilities; space for a marine expeditionary unit, amphibious group, or small-scale joint task force staff; a increase in service-life allowances for new-generation Marine Corps systems (e.g., MV-22 *Osprey* and the F-35 Joint Strike Fighter); and substantial survivability upgrades.

Status
Milestone B was reached in January 2006. The first LHA(R) was designated LHA 6 in August 2005. LHA 6 detail design and construction contract was awarded in FY 2007, and delivery is planned for October 2013. Contract negotiation for LHA 7 is in progress.

Developers
Huntington Ingalls Industries-
Ingalls Shipbuilding — Pascagoula, Mississippi

LHD 1 Wasp-Class Amphibious Assault Ship

Description
The Wasp (LHD 1)-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 sea-based maneuver/assault operations as well as employing elements of a landing force through a combination of helicopters and amphibious vehicles. The Wasp-class warships also have several secondary missions, including power projection and sea control. The LHD 1 ships increase total lift capacity by providing 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 capacity, C4ISR, and self-defense improvements, fire fighting and damage-control enhancements, and Women-at-Sea accommodations. LHD 8 (Makin Island) incorporates significant design changes including gas turbine (GT) propulsion, electric drive, and all-electric equipment. Two GTs, providing 70,000 shaft-horsepower, replace the two steam plants found on earlier ships in the class while the electric drive propels the ship while operating at low speeds to increase fuel efficiency. All ships in the class will be modified to support the Joint Strike fighter (JSF) Short Take-Off Vertical Landing (STOVL), F35 B). The first F3-35B LHD testing occurred in October 2011 aboard USS Wasp.

Status
Eight LHDs have been delivered to the Fleet. The final ship of the class, Makin Island LHD 8, was commissioned October 24, 2009 in San Diego, California.

Developers
Huntington Ingalls Industries-Ingalls
Shipbuilding — Pascagoula, Mississippi

LPD 17 San Antonio-Class Amphibious Transport Dock Ship

Description

The San Antonio (LPD 17)-Class is an amphibious transport dock ship optimized for operational flexibility and designed to meet Marine Air-Ground Task Force (MAGTF) lift requirements in support of the expeditionary maneuver warfare concept of operations. The San Antonio-Class LPDs are 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 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 (LPD 4) class the LPD 17 class replaces), 34,000 cubic feet for cargo, accommodations for approximately 720 troops (800 surge), and a medical facility comprising 24 beds and four operating rooms (two medical and two dental). The aft well deck can launch and recover traditional surface assault craft as well as two landing craft air cushion (LCAC) vehicles capable of transporting cargo, personnel, Marine tracked and wheeled vehicles, and tanks. The LPD 17 aviation facilities include a hangar and flight deck (33 percent larger than Austin-class) to operate and maintain a variety of aircraft, including current and future fixed- and 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, and significant quality of life improvements.

Reducing total ownership costs (TOC) 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 has reduced about $4.5 billion from the program's TOC.

Status

The initial contract award to design and build the lead ship of the class was awarded to the Avondale-Bath Alliance in December 1996. The Navy transferred LPD 17 class workload from Bath Iron Works to Northrop Grumman Ship Systems (NGSS) (Now Huntington Ingalls Industries) in June 2002. LPDs 17 through 21 have delivered, and New York (LPD 21) was commissioned in November 2009. In early 2012, LPDs 22 through 25 are under construction, and the contract for LPD 26 was awarded on April 1, 2011. San Diego (LPD 22) began construction in July 2006, and delivered in December 2011.

Developers

Huntington Ingalls Industries-Avondale Shipyard	New Orleans, Louisiana
Huntington Ingalls Industries-Ingalls Shipbuilding	Pascagoula, Mississippi
Raytheon	San Diego, California

LSD 41 Whidbey Island-/49 Harpers Ferry-Class Dock Landing Ship

Description

The mission of both the Dock Landing Ship (LSD) classes is to transport and launch AAVs and landing craft with its crews and embarked personnel in an amphibious operation. The key difference between the Whidbey Island LSD 49-class and the Harpers Ferry LSD 41-class is that the LSD 49-class cargo variants have significantly expanded cargo and ammunition stowage facilities over those of the LSD 41-class at the cost of decreased Landing Craft Air Cusion (LCAC) capacity from four to two. The Whidbey Island-class is the primary support and operating platform for LCACs and can also provide limited docking and repair services as a boat haven for small ships and craft. Both LSD classes have two primary helicopter spots, and can handle Navy and Marine Corps helicopters currently in the inventory. Neither class is configured with a helicopter hangar, with aircraft fueling and rearming conducted on the flight deck. LSDs are equipped with a vehicle turning area (turntable) and tactical logistics communication spaces to facilitate and coordinate troop/vehicle movement and logistics. These ships have a doctor and dentist assigned as ship's company, two dental examination rooms, and one medical operating room.

Status

Currently there are twelve operating LSDs in the fleet: eight Whidbey Island Class and four Harpers Ferry Class. Mid-life programs are designed around a 52-week maintenance availability with five ships already completed and two are in progress. The mid life program finishes in 2015. The mid life program will enable both the Whidbey Island and Harpers Ferry classes to meet amphibious mission requirements and a 40-year expected service life through 2038. The mid life program is to improve material condition readiness; replace obsolete equipment; provide hull, mechanical, and electrical systems upgrades. The Navy plans to decommission two LSD 41s in FY 2014.

Developers

Avondale Industries Inc.	New Orleans, Louisiana
Lockheed Shipbuilding	Seattle, Washington

MCM-1 Avenger-Class Mine Countermeasures Ship Modernization (MCM Mod)

Description

The Avenger (MCM-1) surface mine countermeasures ships are used to detect, classify, and neutralize or sweep mines in sea lines of communication and naval operating areas. These ships are one "leg" of the mine countermeasures "triad" comprising airborne MCM and explosive ordnance disposal forces. The MCM modernization improvements will assist the class in reaching its 30-year expected service life.

MCM Mod corrects the most significant maintenance and obsolescence issues in order to maintain the ships through their full 30-year service lives. The MCM-1 modernization package includes: planned product improvement program upgrades on the Isotta Fraschini main engines and generators for MCM-3 through MCM-14; replacement of the SLQ-48 mine neutralization vehicle, addressing obsolete components; upgrading the existing SQQ-32 sonar with high-frequency wide-band capabilities; and replacing the existing acoustic sweep system with the Advanced Acoustic Generator/Infrasonic Advanced Acoustic Generator system. Other major hull, mechanical, and electrical alterations include upgrades to the 400-Hz distribution system, replacement of aft deck hydraulic equipment with electric equipment, replacement of the diesel generator analog voltage regulators with digital voltage regulators, and upgrading the navigation system.

Status

The 14-ship MCM Mod program commenced in FY 2004 and is scheduled to complete by 2016.

Developers

Raytheon — Portsmouth, Rhode Island

Mobile Landing Platform (MLP)

Description

The Mobile Landing Platform (MLP) is based on commercial float-on/float-off (FLO/FLO) technology to provide a surface interface between large medium-speed roll-on/roll-off (LMSR) prepositioning ships and Landing Craft Air Cushion (LCAC) surface connectors. The MLP is a major component to the Navy-Marine Corps solution for enhancing Maritime Prepositioning Squadrons (MPSRON) throughput capabilities by expanding operating environments and access opportunities. The MLP is approximately 730 feet in length with a beam of 165 feet—more than a third wider than most ships—making it an extremely stable platform for sea base operations. Its size and ability to ballast will permit at-sea transfer of vehicles and equipment and delivery of transferred assets ashore in sea state 3 at non-anchorage depths, facilitating offload operations at greater distances than possible today.

Status

The Navy awarded contracts for the first two MLPs in FY 2011, and the lead MLP commenced construction in June 2011. The second MLP's start of construction was scheduled for early 2012. The third MLP is planned for award in FY 2012 with advanced procurement for long lead-time material awarded in FY 2011. Lead-ship initial operating capability (IOC) and incorporation into the Maritime Prepositioning Force is projected for 2015.

Developers

General Dynamics NASSCO San Diego, California

EXPEDITIONARY SYSTEMS

Assault Breaching System (ABS)

Description

The ABS program focuses on development of standoff systems to locate and neutralize mine and obstacle threats in the surf and beach zones. The program uses a "system of systems" approach that includes incremental development of the Coastal Battlefield Reconnaissance and Analysis (COBRA) mine/obstacle detection system, the Countermine System (CMS), and precision craft navigation and lane marking. The Joint Direct Attack Munition (JDAM) Assault Breaching System (JABS) provides the 2012 in-service neutralization capability against "proud" (i.e., not buried) mines and obstacles in the beach and surf zone. CMS will provide neutralization capability for buried and surf zone mines. The platform for the COBRA system is the Fire Scout VTUAV. Platforms for employment of the neutralization systems include naval strike aircraft and Air Force bombers.

Status

The COBRA Block I system achieved Milestone C in FY 2009, and IOC is scheduled for FY 2012. JABS is a fielded capability in the beach and surf zone with a planned expanded very-shallow water capability by FY 2013. The CMS munition will achieve IOC in FY 2018.

Developers

Arete	Tucson, Arizona
Boeing	St. Louis, Missouri
Technology Systems Inc	Brunswick, Maine

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 operated from the MH-60S helicopter as one of four airborne mine countermeasures (AMCM) weapon systems onboard the Littoral Combat Ship (LCS). The AQS-20A system will also serve as the mine sensor subsystem of the Remote Mine Hunting System (RMS) hosted onboard LCS.

Status

Milestone C and LRIP I occurred in FY 2005. Improvements to computer-aided detection/computer-aided classification and environmental data collection capabilities are being implemented via enhanced research and development efforts. AQS-20A IOC is projected for FY 2014.

Developers

Raytheon	Portsmouth, Rhode Island

Biometrics / Identity Dominance System (IDS)

Description

The Identity Dominance System (IDS) program of record will provide biometric and limited forensic collection capabilities for visit, board, search, and seizure (VBSS) teams conducting expanded maritime interception operations (EMIO). The program expands naval force capabilities by providing VBSS teams with the ability to verify the identities of known or suspected terrorists and persons of interest through the use of facial recognition, iris scan, and fingerprints. Additionally, the system will have the ability to collect documents and media for further exploitation.

Status

Fleet VBSS teams use commercial-off-the-shelf (COTS) biometric collection devices to collect and transmit biometric information to the DoD's authoritative biometric database for "match/no-match" analysis. Approximately 200 of these kits were procured in FY 2006/07 and fielded to VBSS-capable ships. The initial fielding provided stopgap biometrics capabilities for naval forces, however. Research and development efforts are underway to develop a robust multi-modal biometric, document, and media exploitation capability through the Personnel Identification Version 1 (PIV1)––formerly known as Identity Dominance System (IDS)—program of record.

The Personnel Identification Version One System in development will expand current biometrics capabilities through use of a rugged, lightweight system capable of collecting multiple biometric modalities and electronic media for subsequent matching and analysis. The JROC approved the IDS Capabilities Development Document in September 2008 and IDS achieved Milestone B in late FY 2010; IDS initial operating capability in planned for early FY 2013.

Developers

Naval Surface Warfare Center	Dahlgren, Virginia
Aware Inc.	Bedford, Massachusetts

CBRN Monitoring and Survey Set, Kits and Outfits (CBRN MSSKO)

Description

Chemical, Biological, Radiological and Nuclear (CBRN) Dismounted Reconnaissance Sets, Kits, and Outfits (DR SKO) is an organic suite of specialized CBRN and weapons of mass destruction (WMD) detection and protection equipment providing Navy boarding teams with the capability to conduct efficient and thorough reconnaissance survey and monitoring missions on boarded vessels in response to CBRN/WMD threats. It provides visit, board, search and seizure (VBSS) forces with the capability to detect or deny the presence of WMD in support of

WMD interdiction (WMD-I) missions. Specifically, the DR SKO provides:

- Detection and Identification capabilities
  - Radiological and nuclear material
  - Chemical warfare agents and biological warfare agent
  - Toxic industrial chemicals/materials
  - Oxygen levels and combustible gases
  - Some explosives and drugs
- Individual personnel protective equipment
- Integrated radio/wireless communications

Status

The Navy's participation in this program is a response to a Commander, U.S. Naval Forces Central Command (COMUSNAVCENT) urgent operational need to provide VBSS teams with the capability to identify and detect CBRNE/WMD material. Approximately 163 radiation detection/hazardous atmospheric kits were procured in FY 2007-2008. Each kit consists of:

- Six UDR-15 Personal Radiation Detectors
- Six Handheld Radiation Monitors
- One Thermo IdentiFinder Ultra NGM (used to identify isotopes)
- One Chameleon TIC vapor and gas detector
- One GAMIC 4 gas analyzer
- One nIK drug-testing kit

The Navy is fielding this equipment to deploying VBSS-capable ships as an interim capability until the DR SKO program reaches IOC, planned for FY 2014.

Developers

JPM-NBC CA	Aberdeen PG, Maryland
FLIR/ICx	Elkridge, Maryland

Naval Quickstrike Mines

Description

The in-service Quickstrike family of aircraft-delivered bottom mines is being 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. The Quickstrike mines are the only mines in the Navy's inventory. They include one dedicated thin-wall mine—the 2,300-pound Mk-65 weapon—and two mines converted from conventional bombs: the Mk-62 500-pound and Mk-63 1,000-pound mines.

Status

In-service support continues for current inventories and funding is in place for algorithm development and procurement of the TDD Mk-71.

Developers

SECHAN Electronics, Inc.	Lititz, Pennsylvania

Navy Energy Program

Description

The Navy Energy Vision addresses energy as a strategic resource. The Navy understands how energy security is fundamental to executing our mission afloat and ashore, and the service must be resilient to potential energy futures. Realizing the Navy Energy Vision will require a comprehensive, Navy Department-wide strategy and program comprising strategic imperatives and goals that align with the Department of Defense and federal government approach to energy and climate issues. The Navy Energy Strategy guides a strong portfolio of investments in people, technology, and programs across Navy enterprises. In the near-term, the Navy will make significant gains by adjusting policies to enable more energy efficient operations, encouraging awareness and energy-conscious behavior in every Navy setting, optimizing existing technologies to reduce energy consumption, and speeding the implementation of new technologies, all with the intent of enhancing or enabling greater combat readiness and mission success.

The Navy Energy Program is built on strategic imperatives to assure mobility and protect critical infrastructure, lighten the load and expand tactical reach, and lessen the environmental impact of our "footprint"—imperatives that are aligned with the Secretary of the Navy's energy targets. Our goal is not only to increase the use of alternatives both tactically and ashore, but also to invest in efficiency-enhancement and consumption-reduction initiatives that reduce the overall requirement for petroleum. Our energy program will pursue initiatives that advance combat capability and reduce reliance on fossil-based energy. Additionally, this strategy will serve to accomplish the goals set in the legislation and executive orders for our shore infrastructure and advance Navy leadership in energy security.

To that end, the Tactical Navy Energy Program lays out a balanced investment strategy that capitalizes on near-term quick-win gains, mid-term development of efficiency initiatives that can be incorporated into legacy equipment and systems, and long-term science and technology investment to explore game-changing technology. This balance is achieved with investment at the "knee in the curve," where the best return in terms of fuel saved is delivered.

For shore and infrastructure investment, this balance is achieved through a watch, partner, and lead strategy. This approach allows Navy to watch maturing technology and invest when/where viable (e.g., solar and wind), partner to develop needed technology with other government organizations or industry (e.g., SmartGrid), and lead the development of mission critical technologies (e.g., ocean energy for island bases). Doing so allows Navy to invest to achieve our goals on a path that meets legislative requirements and sets the stage to achieve our larger, long-term objectives.

Status
The Navy's FY 2013 investment maintains the enhancements made in FY 2012, including additional funds to address shore energy legislative requirements and tactical energy initiatives that target energy efficiency, reduce energy consumption, and complete alternative fuel test and certification to lay the foundation for increased alternative fuel use.

Developers
To be determined.

WLD-1 Remote Minehunting System

Description
The AN/WLD-1 RMS is a semi-submersible, unmanned vehicle that tows an AQS-20A sonar to conduct minehunting operations and will be operated from Freedom/Independence LCS-class ships. RMS is launched with a pre-programmed search pattern and will search detect, classify, and identify non-mine objects and mine threats. RMS is capable of line-of-sight and over-the-horizon operations. Once the mission is completed, RMS will return to the ship and data will be downloaded for Post-Mission Analysis (PMA) and subsequent neutralization of threats detected and classified.

Status
RMS completed a Nunn-McCurdy recertification process on June 1, 2010 and is an ACAT 1D post-Milestone B program. In FY 2012, RMS is conducting phase 1 of 3 of its reliability growth program to improve its operational availability. Milestone C is scheduled for late FY 2014 and Initial Operational Capability for FY 2015.

Developers
Lockheed Martin — Riviera Beach, Florida

SECTION 5

INFORMATION DOMINANCE

Information dominance enables end-to-end defense and management of Navy networks and the information and knowledge that is transported by those networks. The Navy's information capabilities and info-centric communities place the Navy in a better position to meet the challenges and threats of the Information Age. Success in the Information Age will require unmatched mastery of the capabilities, tools and techniques that enable us to collect, process, analyze and apply information.

COMMUNICATIONS AND NETWORKS

Automated Digital Network System (ADNS)

Description

ADNS is the key enabler for delivering net-centric capabilities that depend upon robust, dynamic, adaptable, survivable, and secure communications. ADNS is the shipboard network interface that enables connectivity between the ship's internal network and the outside world via the radio frequency (RF) spectrum and land line when pierside. ADNS is also installed in Navy Network Operations Centers (NOCs), enabling the NOCs to transmit and receive voice and data to and from ships underway or pierside. ADNS provides Unclassified, Secret, Top Secret, and various joint, allied, and coalition services to interconnect to the Defense Information Systems Network (DISN). ADNS Increment I combines Internet Protocol (IP) traffic from different enclaves and transmits across available communications paths. ADNS Increment II added the capability to manage traffic from multiple enclaves simultaneously over multiple transit paths including RF and terrestrial links, but still did not satisfy the Fleet's need for a higher throughput. Increased throughput and converged IP (voice, video, and data) capabilities were delivered to the Fleet with the deployment of Increment IIa/IIb. ADNS Increment III brings a protected core, reducing the exposure to cyber warfare network infiltration. It will support 25 megabits per second (Mbps) aggregate throughput for submarines and unit-level ships and 50 Mbps aggregate throughput for force-level ships. ADNS Increment III is a key enabler of our counter-A2/AD (anti-access and area-denial) capability.

Status

In FY 2005, all active ships and ashore NOC facilities were equipped with either ADNS Increment I or II; additionally, all active submarines and broadcast control authority (BCA) facilities were equipped with Increment I. In FY 2006, ADNS Increment IIa installations began on aircraft carriers, large-deck amphibious assault ships, and fleet commander flagships (force-level ships). In FY 2007, ADNS Increment IIb installations began on unit-level ships. In FY 2008, select airborne platforms were incorporated into ADNS, bringing network connectivity to additional fleet assets. Increment III low-rate initial production began in FY 2009. ADNS Increment III reached IOC in FY 2010. Ashore NOC installs were completed in FY 2010. Increment III will be installed on all ships and submarines and their respective shore facilities. ADNS increment is planned to reach Full Operating Capability (FOC) in FY 2019.

Developers

PEO C4I	San Diego, California
SPAWAR Systems Center Pacific	San Diego, California
Science Applications International Corporation	Arlington, Virginia
General Dynamics	Taunton, Massachusetts

Base Communications Office (BCO)

Description

Base Communications Office provides:

- Operations and maintenance: Manage telephone switching networks and outside cable plant infrastructure.
- Telephone services: Operate, maintain and manage government and commercial service delivery points providing connectivity to Deference Switch Network (DSN), Public Switched Telephone Network (PSTN), and Federal Telephone System (FTS)
- Billing support: Provide telephone invoice validation and customer billing, issue/track calling cards, process customer requests for services
- Customer support: Aggregation of customer requirements; requirements definition and planning; review of military construction and special projects, and move, add, and change (MAC) of telephone services.

The Fleet Cyber Command manages the program, and the PEO-C4I/PMW790 Shore Telephony Project Office provides acquisition support to BCO program, which serves more than 350,000 Navy personnel worldwide. Lifecycle switch replacement provides Voice Over IP capability.

Status

Naval Computer and Telecommunications Area Master Stations (NCTAMS) BCOs provide base communications services and support to approximately 3,890 Navy and non-Navy shore activities and deployable units. BCOs operate, maintain and manage the communications infrastructure supporting the transport of switched voice, video, and data in support of more than 49 BCOs worldwide. BCOs provide services at 114 campuses (base/station/other) and manage 153 government-owned telephone switches and 21 commercial dial tone (CENTRIX) locations worldwide. This program performs more than 69,000 MACs worldwide, each year, and its operators and auto attendants handle some 320,000 calls per month. BCO Offices send more than 7,000 bills to activities monthly and process 7,500 funding documents annually.

Developers

Navy policy is to procure only hardware and software from the Defense Information Systems Agency (DISA) Joint Interoperability Test command (JITC) tested/certified/interoperable approved products list.

Base Level Information Infrastructure (BLII)

Description

Base Level Information Infrastructure (BLII) modernizes antiquated information technology (IT) and installs state-of-the-art IT capability for outside the continental United States (OCONUS) Navy Enterprise Network (ONE-NET) operations facilities. Its area of responsibility includes 14 major OCONUS fleet concentration bases, stations, and other remote locations. BLII provides the PEO C4I infrastructure, hardware, and software for the Fleet Cyber Command/Tenth Fleet managed ONE-NET NETOPS (e.g., Help Desk, IA, Operations, etc.). BLII provides a fully integrated, interoperable, and secure IT infrastructure that enables the rapid and reliable transfer of voice, video, and data to our forward-deployed OCONUS bases, stations, homeports, and piers. BLII also sustains OCONUS pier IT infrastructure capability, which includes maintaining pier fiber runs, conduits, junction boxes, brow umbilicals, and associated electronics. Modern pier IT infrastructure enables our forward-deployed ships to maintain situational awareness, receive operational and intelligence traffic, and perform maintenance or training on their radio frequency systems while pier side.

The BLII project is under the cognizance of Program Executive Office for Enterprise Information Systems.

Status

Program currently provides IT services to more than 27,000 BLII/ONE-NET seats, supporting approximately 33,000 forward-deployed OCONUS Navy users. Phase I: Migration of legacy networks into the BLII/ONE-NET environment commenced in September 2011 and is planned to be complete by June 2014, depending on the Navy's Enterprise Services program award. Phase II: Migration surveys to integrate BLII/ONE-NET capabilities into the Navy's Enterprise Services will commence by March 2014 and is expected to be complete by June 2015.

Developers

SAIC	San Diego, California
BAH	San Diego, California
Deloitte	San Diego, California
CSC	San Diego, California

Battle Force Tactical Network (BFTN)

Description

The Battle Force Tactical Network (BFTN) provides high-frequency internet protocol (HFIP) and subnet relay (SNR) to allied, coalition, and national naval and maritime units with a direct platform-to-platform tactical networking capability using legacy ultra-high-frequency (UHF) and high-frequency (HF) radios. The two technologies operate efficiently with current legacy equipment providing a cost-effective solution for achieving tactical IP networking at sea. BFTN enables warfighters on Combined Enterprise Regional Information Exchange System-Maritime (CENTRIXS-M) and Secure Internet Protocol Routing Network (SIPRNET) networks to execute and plan in a real-time tactical

environment by transporting IP data directly to and from ships, submarines, and aircraft. BFTN also serves as a primary backup for SIPRNET in the absence of satellite communications. HFIP operates in the HF spectrum and is capable of data rates of 9.6 kbps in single side band (SSB) and 19.2 kbps in independent side band (ISB). SNR operates in the UHF spectrum and is capable of data rates up to 64 kbps. BFTN allows surface platforms the ability to share a single SATCOM resource for reach-back capability. HFIP also supports the hardware/software upgrade requirements for battle force email (BFEM). BFTN is a key enabler of counter anti-access and area-denial (A2AD) capability.

Status

In 2007, USS Harry S. Truman (CVN 75) carrier strike group deployed with HFIP and SNR. The Navy plans to install BFTN on approximately 213 ships, submarines, and aircraft, with full operating capability planned for FY 2020.

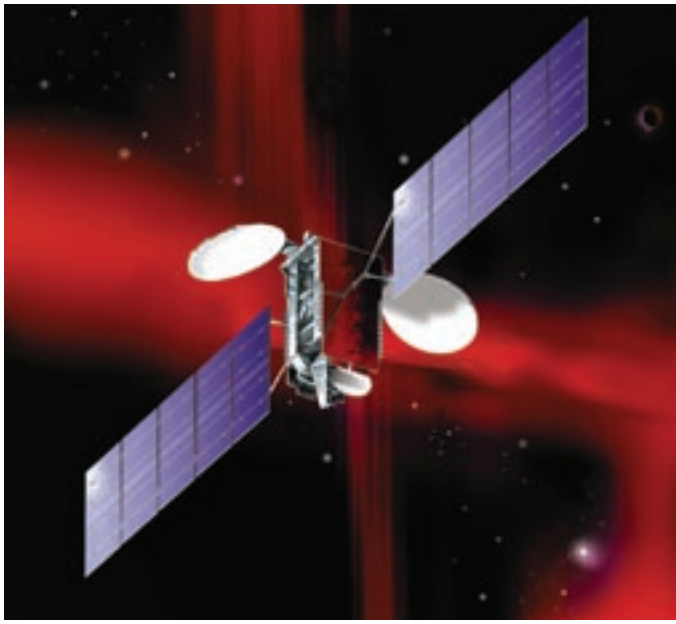
Developers

Rockwell-Collins	Cedar Rapids, Iowa
Quatech	Hudson, Ohio
SAIC	San Diego, California

Commercial Satellite Communications (COMSATCOM)

Description

The Commercial Satellite Communications program serves to augment Military Satellite Communications capabilities and includes following elements: (1) Commercial Broadband Satellite Program (CBSP); (2) Commercial Wideband Satellite Program (CWSP); (3) Inmarsat B High-Speed Data (HSD) Program, and (4) Iridium Program. The primary purpose of CBSP, CWSP, and Inmarsat B HSD is to provide the terminals and architecture for augmentation of high data-rate bandwidth requirements in the fleet that are not otherwise available from military satellite communications (MILSATCOM). This includes SATCOM terminals that deliver voice, video, data, and imagery requirements to the warfighter at-sea, e.g., NIPRNET, SIPRNET, JWICS, DCGS-N, telephones, and video teleconferencing. Iridium is a congressionally directed means of secure emergency voice communications (following USS Cole DDG 67 lessons learned) comprising more than 3,000 Navy users, including all afloat units. The Navy is responsible for the corporate operations and maintenance bill of the DoD Gateway in Hawaii overseen by the Defense Information Systems Agency (DISA). A small amount of funding is also included to maintain a Help Desk (SPAWAR Atlantic) for new Navy users desiring to acquire Iridium.



Status

The CBSP was established as a Rapid Deployment Capability in March 2007, achieved program Milestone C September 2009, IOC in June 2010, and full rate production in September 2011; FOC is estimated for 2020. The other components of commercial satellite communications remain in sustainment and will be phased out except for Iridium—achieving significant efficiencies for afloat broadband communications. The CBSP terminal objective as of the end of FY 2011 includes 30 Small Ship Variant (SSV), 134 Unit

Level Variant (ULV), and 28 Force Level Variant (FLV) installations (a total of 192 ships). As of December 2011, 51 terminals have been installed with 130 remaining to complete, and 68 additional terminals are funded and scheduled for installation between FY 2012 and FY 20 17. Effective December 31, 2011, Navy ships will no longer rely on Inmarsat. Ships will continue to operate with the CWSP AN/WSC-8 until replaced by CBSP AN/USC-69(V) in the FY 2014-2015 timeframe. A select few Unit Level Ships are receiving the CBSP ULV terminal and others might be deferred indefinitely depending on available funding. In late 2011, 28 ships operated legacy CWSP, and two operated Inmarsat.

Developers

CBSP/CWSP: Harris Corporation	Melbourne, Florida
CBSP: CVG, Inc.	Chantilly, Virginia
INMARSAT: NERA	London, England
IRIDIUM: Iridium, LLC	Bethesda, Maryland

Consolidated Afloat Network Enterprise System (CANES)

Description

CANES is a Department of the Navy efficiency initiative and is the Navy's only program of record to replace existing afloat networks and provide the necessary infrastructure for applications, systems, and services to operate in the tactical domain. CANES is the technical and infrastructure consolidation of existing, separately managed afloat networks. These legacy afloat network designs reach end of fife starting in FY 2012, and CANES will replace these existing, unaffordable, and obsolete networks.

The fundamental goal of CANES is to bring infrastructure and platform as a service, within which current and future iterations of tasking, collection, processing, exploitation, and dissemination (TCPED) computing and storage capabilities will reside. CANES will provide complete infrastructure—hardware, software, processing, storage, and end user devices for Unclassified through Sensitive Compartmented Information—for all basic network services to a wide variety of Navy surface combatants, submarines, maritime operations centers, and aircraft. In addition, approximately 36 hosted applications and systems supporting command and control, intelligence, surveillance and reconnaissance, information operations, logistics, and business domains require CANES infrastructure in order to operate in the tactical environment. Specific programs, including the Distributed Common Ground System-Navy (DCGS-N), Global Command and Control System-Maritime (GCCS-M), Naval Tactical Command Support System (NTCSS), and Undersea Warfare Decision Support System (UWDSS), are dependent on the CANES Common Computing Environment (CCE) to field, host, and sustain their capability because they no longer provide their own hardware.

CANES will field on rolling four-year hardware and two-year software baselines. CANES will reduce the number of afloat networks and provide enhanced efficiency through a single engineering focus on integrated technical solutions. This will allow for streamlined acquisition, contracting, and test events, and significant lifecycle efficiencies through consolidation of multiple

current configuration management baselines, logistics, and training efforts into a unified support structure.

The existing afloat networks that CANES will replace include Integrated Shipboard Network Systems (ISNS), Combined Enterprise Regional Information Exchange System-Maritime (CENTRIXS-M), Sensitive Compartmented Information (SCI) Networks, and Submarine Local Area Networks (SubLANs). In addition, CANES will provide functionality currently provided in the Video Information Exchange System (VIXS) and elements of Afloat Computer Network Defense (ACND).

Status
The CANES Milestone B was approved in January 2011. The CANES program is under a competitive Engineering and Manufacturing Development contract with down-select to a single CANES design planned for the second quarter FY 2012. The first CANES installation is planned aboard a destroyer platform in the fourth quarter FY 2012. CANES will achieve full deployment by FY 2023.

Developers

Lockheed Martin MS2 Tactical Systems	San Diego, California
Northrop Grumman Space and Mission Systems Corporation	Reston, Virginia

Defense Red Switch Network (DRSN)

Description
The Defense Red Switch Network (DRSN) is the secure circuit-switched element of the Defense Information System Network (DISN) providing reliable and high quality secure voice, data, and conferencing capabilities to senior national, combatant commander, and fleet commander decision-makers. The DRSN program ensures that operational commanders have immediate access to a Flash-Precedence, robust, secure, physically diverse, and survivable voice network. The Department of Defense and select federal agencies have a continuing operational requirement for a separate, controlled, and inter-operable secure communications and conferencing network to support command, control, and crisis management activities. The DRSN capability satisfies that requirement and comprises a network of circuit switches interconnected by the DISN backbone and commercial transmission links.

Status
As assigned by the Joint Staff, the Navy has responsibility for operations and maintenance of five switches in the DRSN network: Commander, Joint Forces Command (Norfolk, Virginia); Commander, Pacific Command (Camp Smith, Hawaii); Commander, Pacific Fleet (Pearl Harbor, Hawaii); Commander, Naval Forces Europe (Naples, Italy); and Commander, U.S. Naval Forces Central (Manama, Bahrain). The Fleet Cyber Command (FCC) is responsible for facilities, personnel, training, logistics, security and accreditation, and command policy for DRSN assets under Navy operational control.

Developers
Various.

DoD Teleport

Description

Department of Defense (DoD) Teleport links the satellite communications space segment with the shore infrastructure and provides tactical users with a worldwide communications interface to the Global Information Grid (GIG). Through multiple primarily military but also commercial radio frequency media, DoD Teleport provides inter-theater reach-back into the Defense Information Systems Network (DISN) and service C4I (command, control, communications, computer intelligence, surveillance and reconnaissance) systems, as well as intra-theater communications support for tactical users. In 2001, DoD designated Navy as the DoD Teleport requirements sponsor with the Defense Information Systems Agency (DISA) as the executive agent. Teleports are located at six primary sites and one secondary site. The Navy operates and maintains teleports at Wahiawa, Hawaii; Northwest, Virginia; Lago Patria, Italy; and Bahrain. Non-Navy Teleport sites are located at Fort Buckner, Okinawa, Japan; Camp Roberts, California; and Landstuhl/Ramstein, Germany.

Status

DoD Teleport Generation (GEN) I and II are in sustainment, and GEN III has commenced procurement. GEN III comprises three phases. Phase 1 provides Advanced EHF (AEHF)-capable terminals at the teleports using the Navy Multiband Terminal (NMT). Phase 1 reached Milestone (MS) C in Sept 2010, and NMT installs will begin in the second quarter of FY 2012. Phase 2 upgrades the X/Ka band terminals, using the Army Modernization Enterprise Terminal (MET) to ensure compatibility with the Wideband Global Satellite constellation. Phase 2 went through a successful Critical Design Review (CDR) in FY 2011. A MS C decision is expected in the third quarter FY 2012. GEN III Phase 3 provides Mobile User Objective System-to-legacy Ultra High Frequency (MUOS-UHF) interoperability. DoD Teleport GEN III will reach Full Operational Capability (FOC) in FY 2016/2017.

Developers

Arrowhead	Alexandria, Virginia
ViaSat	Carlsbad, California
Raytheon	St. Petersburg, Florida
ITT	Colorado Springs, Colorado

Enterprise Services

Description

Enterprise Services establishes IT services at the Navy's enterprise level to provide opportunities for expanding user capabilities tailored to Navy needs while increasing security and reducing acquisition/maintenance costs. Enterprise Services will provide the capability to manage and deliver the Navy's IT centrally, reduce the total IT overhead costs, promote information sharing and interoperability in the Department of the Navy (DoN) and Department of Defense (DoD), ensure compliance with DoD and congressional IT mandates, and significantly improve the Navy's

information assurance (IA). No matter where users connect to the Navy or DOD, they will seamlessly access IT resources. Initial efforts in Enterprise Services focus on consolidating data centers and portals as well as establishing enterprise software licensing. Managing services at the enterprise level provides an opportunity to eliminate outdated systems that inhibit the Navy warfighters' capability to access mission critical information. The Navy is intensifying efforts to eliminate legacy networks, servers, systems, applications, and duplicative data environments. These enterprise services will be leveraged across the DoN to provide seamless connectivity to mission-critical information.

Status

The Navy is in the process of consolidating its data centers dispersed throughout the Continental United States (CONUS). The Navy Data Center Consolidation (DCC) initiative will leverage Navy Space and Naval Warfare Center (SPAWAR) providing Enterprise-Level management over systems, applications, and database hosting requirements for Navy. Over the Future Years Defense Program (FYDP), the Navy will consolidate 125 data centers to a goal of less than 30 by FY 2017, consolidating approximately 12 data centers per year. In addition to DCC, the Navy is actively engaged in other IT efficiency efforts, including Enterprise Software Licensing (ESL), Navy Portal Consolidation, and Application Rationalization. The Department of the Navy will establish enterprise service license (ESL) agreements with major software manufacturers starting in FY 2012.

Developers

SPAWAR is the Navy's IT Technical Authority leading the DCC effort. There are multiple industry partners.

Global Broadcast Service (GBS)

Description

The Global Broadcast Service (GBS) is a military satellite communications (MILSATCOM) extension of the Global Information Grid (GIG) that provides worldwide, high capacity, one-way transmission of voice, data, and video supporting fleet command centers and joint combat forces in-garrison, in-transit, and deployed to global combat zones. Specific products include unmanned aerial vehicle feeds, imagery, intelligence, missile-warning, weather, joint and service-unique news, education, training, video, homeland defense data, and various other high-bandwidth services. GBS is a joint ACAT1 program overseen by the Air Force, and Navy GBS is an ACAT3 program that aligns to joint development. GBS interfaces with other communications systems in order to relieve overburdened and saturated satellite networks and provide information services to previously unsupportable (due to low bandwidth) users. It provides fleet and strike group commanders the highest broadband data rate currently available afloat, up to 23.5 Mbps per channel on UHF Follow-On (UFO) satellites and 45Mbps with the Wideband Global Satellite (WGS) constellation. GBS also enables critical delivery of information products while operating in emissions control (EMCON) or anti-access/area-denial (A2AD) environments.

Status

GBS is fully deployed and is undergoing sustainment and improvement efforts. Installations include aircraft carriers, assault and command ships, submarines, and a limited number of cruisers and destroyers. Architectural enhancements permit improved sharing and reallocation of broadcast coverage and bandwidth between users, information products, media types, and security levels. In FY 2009, Navy GBS began fielding split internet protocol (IP) technology that enables users to request real-time data via an alternate off-ship system for delivery via GBS, which significantly enhances the warfighter's situational awareness. During FY 2010, the Navy GBS program completed fielding to Los Angeles (SSN 688I)-class submarines, began fielding 26 additional unit-level cruiser/destroyer systems, and started to field the initial system-wide Navy GBS technology refresh. FY 2011 brought worldwide SIPRNET split IP capability.

Developers

USAF Space and Missile Systems Center	El Segundo, California
Raytheon	El Segundo, California
SPAWAR Systems Center Pacific	San Diego, California
SPAWAR Systems Center Atlantic	Charleston, South Carolina

Information Systems Security Program (ISSP)

Description

The Navy's Information Systems Security Program (ISSP) procures secure communications equipment for Navy ships and supporting shore sites, aircraft, the Marine Corps, and the Coast Guard. Information Assurance (IA) is information operations undertaken to protect and defend information, information-based processes, and information systems by ensuring their availability, integrity, authentication, confidentiality, and non-repudiation, which includes providing for the restoration of information systems by incorporating protection, detection, and response capabilities. The ISSP provides information assurance capabilities to protect information systems from unauthorized access or unauthorized modification and against the denial of service to authorized users or provision of service to unauthorized users.

The ISSP employs a layered protection strategy using commercial-off-the-shelf and government-off-the-shelf (GOTS) hardware and software products that collectively provide multiple levels-of security mechanisms to detect and react to intrusions. IA is critical in protecting our ability to wage network centric warfare (NCW), and the ISSP supports the entire naval cyberspace domain that includes the mobile forward-deployed subscriber and the supporting ashore infrastructure.

Status

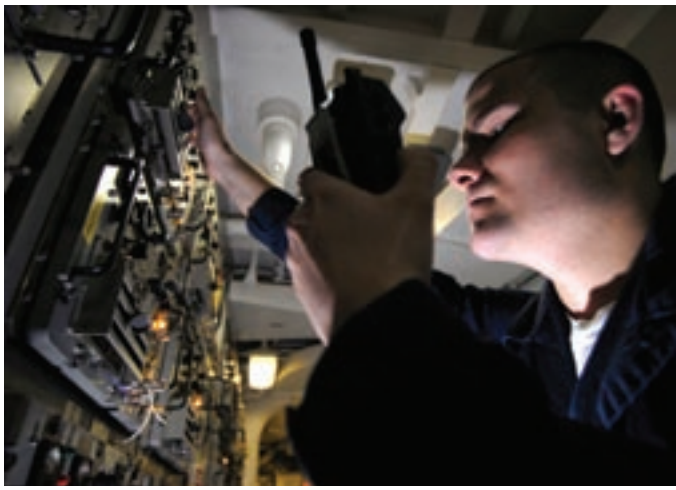
Navy ISSP is a collection of related non-ACAT programs that provide the full spectrum of Information Assurance and Computer Network Defense (CND) capabilities. These programs are in various phases of

the acquisition process, from concept development through capability sustainment. Navy's ISSP will continue to provide CND tools, technology, national cryptographic equipment, products, operations, people, and services in alignment with the Department of Defense Cyber Defense Program.

Developers

BAH	San Diego, California
Northrop Grumman	Los Angeles, California
PROMIA	San Francisco, California
SAIC	San Diego, California

Integrated Broadcast Service/ Joint Tactical Terminal (IBS/JTT)



Description

The Integrated Broadcast Service (IBS) is a system-of-systems that will migrate the Tactical Receive Equipment (TRE) and related Tactical Data Dissemination System (TDDS), Tactical Information Broadcast Service (TIBS), Tactical Reconnaissance Intelligence Exchange System (TRIXS), and Near-Real-Time Dissemination (NRTD) System applications into an integrated service with a common message format. The IBS will send data via communications paths such as UHF SATCOM and via networks over SHF, EHF, and Global Broadcast Service. This program supports indications and warning, surveillance, and targeting data requirements of tactical and operational commanders and targeting staffs across all warfare areas. The Joint Tactical Terminal (JTT) is a multi-channel transmit and receive radio with onboard capabilities to filter, process, and translate the IBS data for shipboard use on Tactical Data Processors (TDP). The JTT is being upgraded to become interoperable with the new Common Interactive Broadcast (CIB), which employs the new Common Message Format (CMF) and Demand Assigned Multiple Access (DAMA) Integrated Waveform (IW).

Status

The Navy commenced shipboard installations of JTT in FY 2001, and 87 JTTs have been fielded as of late 2011. The transition to the next-generation broadcast services is expected to begin in FY 2012 with the delivery of upgrade kits from the manufacturer. In order to support the addition of new ships within the Navy, which require access to IBS, the Navy has contracted with Raytheon Systems to reopen the JTT production line with a multi-year IDIQ contract for new JTT systems beginning in FY 2012.

Developers

IBS: L-3 Communications	Fairfax, Virginia
JTT: Raytheon Systems	St. Petersburg, Florida

Joint Tactical Radio System (JTRS)

Description

Joint Tactical Radio System program is developing a software-programmable, multi-band, multi-mode family of networked radios capable of simultaneous voice, data, and video communications. The program will migrate more than 25 radio families, encompassing thousands of radio systems, to the JTRS family of radio systems. All radios will be compliant with the software communications architecture (SCA), a single, open-system architecture. JTRS will be developed with a focus toward integrated Global Information Grid transformational capabilities and will be backward compatible with selected legacy radio systems.

Status

The Navy is principally involved with the JTRS program in order to field a new radio that will interoperate with the new Mobile User Objective System (MUOS) satellite system. Due to changes in the Airborne, Maritime/Fixed (AMF) Station program, it will not deliver the AMF radio. Instead, the Navy has elected to transition to the JTRS Manpack radio under the Handheld, Manpack, Small Form Fit (HMS) program to be installed on ships, submarines, and shore stations throughout the Navy for MUOS purposes. The Navy expects the Manpack radio to begin fielding in FY 2014 with the MUOS waveform.

Developers

General Dynamics — Scottsdale, Arizona

Navy Multi-band Terminal (NMT)

Description

The Navy Multi-band Terminal (NMT) is the future Navy SATCOM terminal that will provide EHF and SHF transport service for Navy ships, submarines, and shore stations. NMT replaces the USC-38 / Follow-on Terminal (FOT) and the WSC-6 SHF SATCOM terminals. NMT supports a variety of protected and wideband C2 communications applications (e.g., secure voice, imagery, data, and fleet broadcast systems). NMT will allow access to current military SATCOM satellites, including protected EHF SATCOM services available on Milstar, EHF payloads on board ultra-high-frequency follow-on satellites, and interim Polar EHF payloads and wideband service on the Defense Satellite Communications System satellites and the follow-on Advanced EHF (AEHF) and Wideband Global Satellites (WGS). NMT is a key element of the Navy's mitigation of anti-access/area-denial (A2AD) environment concerns and is an enabler of the ballistic missile defense mission.

Three international partners—Canada, the Netherlands, and the United Kingdom—plan to procure a variant of the NMT.

Status

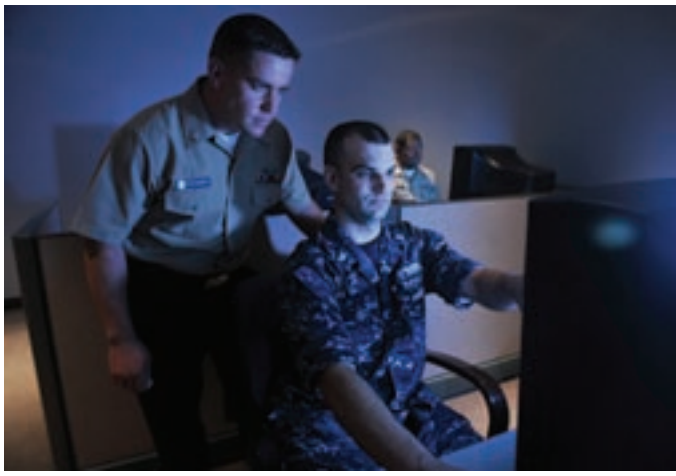
NMT achieved MS C on July 29, 2010. Eighty-seven terminals have been placed under contract in the first two years of production. In-

stallations will begin in February 2012, and IOC is planned for the fourth quarter FY 2012. FOC is planned for 2012.

Developers

Raytheon Marlborough, Massachusetts

NMCI CoSC/Next-Generation Enterprise Network (NGEN)



Description

The Next-Generation Enterprise Network will be the follow-on to the Navy and Marine Corps Intranet (NMCI). NGEN is the first step toward achieving the Department of the Navy's future vision of a fully integrated naval networking environment (NNE), enabling government ownership and operation of the network. NGEN will provide a secure and reliable enterprise-wide voice, video, and data networking environment that meets the warfighter's needs, enabling C2 in conjunction with Consolidated Afloat Network Enterprise Services (CANES), and providing a capability to access data, services, and applications anywhere worldwide. NGEN will arm the warfighter for success on the network-centric battlefield by enabling secure, reliable, and adaptable global information exchange across the full spectrum of operations. For the Marine Corps, the joint task force concept extends to critical infrastructure and warfighting services needed to conduct DoD land component C2 functions and will be supported by MAGTF Information Technology Centers.

Status

The NMCI Continuity of Services Contract (NMCI CoSC) was awarded on July 8, 2010. The NMCI CoSC will continue to provide NMCI services until April 30, 2014 as a bridge contract and will enable the transition to NGEN. The Milestone Decision Authority (MDA) approved the current version of the NGEN Acquisition Strategy (AS), v18.5, on June 24, 1010. NGEN has successfully passed Secretary of the Navy (SECNAV) Acquisition Gate 4; a Gate 5 to approve the Request For Proposal (RFP) is planned for early CY 2012, and a Gate 6 to approve the Capability Production Document (CPD) occurred in October 2011. A draft RFP was released on September 30, 2011. A combined Transport Services (TXS) and Enterprise Services (ES) RFP will be released in FY 2012, and award of the contract(s) is planned for the first quarter FY 2013. A phased NGEN implementation is planned. NGEN will provide the DoN with C2 of the network, it will pace the Nonclassified Internet Protocol Router Network (NIPRNET) threat, and it will lead the Secret Internet Protocol Router Network (SIPRNET) threat. In addition, the DoN will work toward subsequent increments that will add increased warfighting capabilities, adaptability, and reliability.

Developers

EMC	Hopkinton, Massachusetts
Harris	Melbourne, Florida
Harris (formerly Multimax)	Melbourne, Florida
HP Enterprise Services	Plato, Texas
Oracle	Redwood Shores, California
EMC	Hopkinton, Massachusetts
HP Enterprise Services	Plato, Texas
Oracle (formerly Sun)	Redwood Shores, California
Additional Major Subcontractors:	
Cisco (routers and switches)	San Jose, California
NetApp (data storage)	Sunnyvale, California
DLT Solutions (software)	Herndon, Virginia
HP Company (desktops, laptops, servers, printers)	Santa Clara, California
Microsoft (client and server software)	Redmond, Washington
Wildflower International	Santa Fe, New Mexico
Government Activities:	
PEO-EIS (Program Executive)	Arlington, Virginia
PM, NEN (Program Manager)	Arlington, Virginia

OCONUS Navy Enterprise Network (ONE-Net)

Description

The outside the continental United States (OCONUS) Navy Enterprise-Network (ONE-NET) provides the manpower and administration services to operate the Base Level Information Infrastructure (BLII) architecture, a fully integrated and interoperable network that consists of standard hardware, software, and information-assurance suites, governed by operational and administrative policies and procedures. ONE-NET is the OCONUS analog to the Navy's CONUS-based Enterprise Services and is the medium that enables the rapid and reliable transfer of official classified and unclassified messages, collaboration, e-mail, and data. ONE-NET manpower provides IT operations including e-mail, print, storage, directory, and internet services, as well as help desk and enterprise management for a projected 27,000 seats. Meeting fleet commanders' requirements and achieving vast performance and security improvements compared to legacy networks. ONE-NET achieves significant IT efficiencies through the consolidation of 14 data centers including the three Theater Network Operation and Security Centers (TNOSCs) at Yokosuka, Naples, and Bahrain and 11 Network Operations Centers (NOCs) within their respective regions—more than 30 legacy networks.

Status

The program provides IT services to more than 27,000 BLII/ONE-NET seats, supporting approximately 33,000 forward-deployed OCONUS Navy users. The Fleet Cyber Command operates the three TNOSCs and 11 local NOCs servicing ONE-NET customers. Critical network services are provided for: Non-classified Internet Protocol Router Network (NIPRNET), Secret Internet Protocol Router Network (SIPRNET), web/portal access, e-mail, help

desk support, and network security to OCONUS fleet and regional commanders and subordinate commands at 14 OCONUS locations. ONE-NET will assimilate IT operations responsibilities for more than 30 overseas legacy networks per the BLII deployment schedule.

Developers

CSC	Falls Church, Virginia
SAIC	San Diego, California
C4I Corporation	San Diego, California
ITT	White Plains, New York

Numerous other sources. All hardware and software procured and installed in conjunction with the Base Level Information Infrastructure (BLII) program of record is under the cognizance of PEO EIS.

Submarine Communications Equipment

Description

Submarine Communications Equipment creates a common, automated, open system architecture radio room for all submarine classes. The program provides procurement and installation of systems incorporating the technical advances of network centric warfare to allow the submarine force to communicate as part of the strike group. It addresses unique demands of submarine communications, obsolescence issues, higher data rate requirements and includes two elements: Common Submarine Radio Room (CSRR) and Submarine Antennas.

CSRR is a network-centric communications gateway that supports interoperable communications and information dominance between on-board subsystems, external platforms, and land-based communications facilities. CSRR leverages existing Navy and DoD C4I capability based acquisition programs. It allows common systems, software, and equipment, the use of common logistics products, and the uniform training of personnel across all submarine classes. The result is new capability for reduced cost to the Navy.

The Submarine Antennas program supports the development and sustainment of antennas designed to withstand the underwater environment across the spectrum from Very Low Frequency (VLF) to optical. Programs in the development phase include the OE-538 Increment II Multi-Function Mast, the Submarine High-Data-Rate (SubHDR) antenna, the Advanced High-Data-Rate (AdvHDR) antenna, and the Defense Advanced Research Projects Agency (DARPA) Tactical Relay Information Network (TRITON) optical laser program. Improvements to the OE-538 antenna provide Mobile User Objective System (MUOS), Link-16, and Iridium capability to the Increment I antenna that supplies reception in the VLF to UHF frequency bands. The improvements to the SubHDR antenna include the addition of Global Broadcast Service (GBS), enabling access to the Defense Satellite Communications System (DSCS) in the super-high-frequency (SHF) band, and an improved radome. AdvHDR is intended to replace the

SubHDR antenna with improved bandwidth. DARPA TRITON is developing a blue-green optical laser for testing on submerged submarines.

Status

CSRR Increment I Version 2 completes fielding in FY 2012. CSRR Increment I Version 3 begins fielding in FY 2012 and is scheduled to complete in FY 2018. OE-583 Increment II is scheduled for a Milestone C decision in FY 2014. SubHDR GBS/SHF upgrade completes fielding in FY 2012 and SubHDR Radome replacement begins fielding in FY 2013. AdvHDR is scheduled for a Milestone B decision in FY 2014. DARPA TRITON is scheduled to for a technology demonstration in FY 2012.

Developers

Lockheed Martin	Eagan, Minnesota
Naval Underwater Warfare Center	Newport, Rhode Island
Space and Naval Warfare Systems Center	San Diego, California

Super-High-Frequency (SHF) Satellite Communications

Description

The Super-High-Frequency Satellite Communications Program includes the WSC-6(V) 5, 7, and 9 terminals; the X-Band Kit Upgrade to the EHF Follow-On Terminal (FOT) installed on submarines; and the Enhanced Bandwidth Efficient Modem (EBEM) installed on surface ships. The SHF SATCOM WSC-6 terminal is the primary SATCOM terminal in the Fleet, providing the bandwidth for voice, video, data, and imagery requirements for the warfighter, including NIPRNET, SIPRNET, JWICS, JCA, video teleconferencing, and telephones. This terminal has been in the Fleet since the early 1990s. The Navy Multiband Terminal (NMT) WSC-9 will begin replacing the WSC-6 terminal in the FY 2012 timeframe.

Status

As of the end of FY 2011, there were 123 AN/WSC-6 terminals installed in the Fleet. They are expected to continue in operation until FY 2017, when the next-generation Navy Multiband Terminal (WSC-9) will replace them. The X-band upgrade to the EHF FOT (USC-38) terminals on 61 of 64 submarines was completed in 2010. EBEM is the current modem for static point–to-point operations in con-junction with the WSC-6 terminal, the WSC-8 terminal, the next-generation Navy Multiband Terminal (WSC-9), and the next-generation Commercial Broadband Satellite Program (CBSP) terminal (USC-69). As of late 2011, 275 EBEM modems have been installed in the Fleet.

Developers

AN/WSC-6(V) 5, 7: Raytheon	Marlborough, Massachusetts
AN/WSC-6(V) 9: Harris	Melbourne, Florida
X-Band Kit Upgrade: Raytheon	Marlborough, Massachusetts
EBEM: Viasat	Carlsbad, California

Telephony

Description

The Navy's Telephony program procures and installs fully integrated, interoperable, IA-certified telephony systems and peripherals in support of Defense Switch Network (DSN) telephone switches and connectivity to the commercial telephone network at Fleet Cyber Command (FCC) shore installations. Telephony provides system sustainment, obsolescence management, and technology refresh for shore telephone switches that service our worldwide forces necessary to ensure regulatory compliance and prevent capability degradation. Specific Telephony capabilities include the following:

- Voice (Analog, Digital, ISDN, VoIP), Conferencing, Voicemail, Call Centers, and Telephony Management System (TMS)
- Switches provide trunking to support telephone, VTC, and data services to customers ashore/afloat
- C2 Voice Communications to the Navy warfighter to include Multi Level Precedence and Preemption (MLPP)
- Engineering support for Base Communications Office (BCO)
- C2 Shore to Ship Dial Tone (POTS and Pier lines) via tactical networks and infrastructure
- VoIP and future enterprise capabilities
- Sustainment of FCC/C10F-owned switches (~115 OCONUS)

Telephony suite replacement and modernization funding ensures that all telephony equipment under Navy's purview in the continental United States (CONUS) and outside CONUS (OCONUS) are replaced in accordance with industry life cycle standards and that software is upgraded in a systemic manner to ensure compatibility with DoD and commercial telephone systems. The majority of the Navy's telephone switches are Defense Switched Network (DSN) switches. These switches provide on-base Federal Telephone System (FTS) local and long-distance calling service as well as worldwide DSN connectivity.

Status

Telephony is replacing Time Division Multiplex (TDM) switches with Voice Over IP (VOIP) technology in response to TDM technology obsolescence. As Telephony capabilities migrate to VOIP they will become increasingly reliant on Navy Enterprise Services and achieve corresponding efficiencies.

Developers

BAH	San Diego, California Norfolk, Virginia
Prosoft	Norfolk, Virginia
Secure Mission Solutions	Norfolk, Virginia

INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE (ISR)

EP-3E *Aires II* Modification and Sustainment

Description

The EP-3E *Aires II* is the Navy's premier manned airborne intelligence, surveillance, reconnaissance, and targeting (AISR&T) platform supporting naval and joint commanders. EP-3Es provide long-range, high-endurance support to carrier strike groups and expeditionary strike groups in addition to performing independent maritime operations. The 2012 force consists of two active-duty squadrons based at Naval Air Station Whidbey Island, Washington. Although optimized for maritime and littoral environments, capability upgrades have ensured EP-3E mission effectiveness in support of global contingency operations. The fusion of IP connectivity with SIGINT upgrades enables continued alignment with the intelligence community (IC) and the early implementation of a distributed SIGINT concept of operations. Multi-INT sensors, robust communication and data links, and employment on the flexible and dependable P-3 air vehicle ensure effective AISR&T support to conventional and non-conventional warfare across the range of military operations. Operating around the globe, the EP-3E continues to satisfy critical Navy, joint, and combatant commander airborne ISR priorities and requirements. With the EP-3E scheduled for retirement in FY 2019, the Navy is focused on sustainment and modernization to pace emerging threats until a replacement capability is fielded with a family of ISR systems.

Status

EP-3E aircraft are the focus of several sustainment and modernization initiatives.

Sustainment: A series of special structural inspections (SSIs) and replacement of outer wing assemblies (OWAs) will provide the inspections and repairs necessary to ensure safety of flight until more comprehensive maintenance can be performed. These pre-emptive modification and replacement of critical structural components allow up to 7,000 additional flight hours. These programs ensure sustainment of the EP-3E fleet until the capability is recapitalized.

Modernization: The EP-3E Joint Airborne SIGINT Architecture Modification Common Configuration (JCC) program will accelerate advanced capabilities to the fleet. The resultant program aligns mission systems to meet the challenges of rapidly emerging threat technology and addresses obsolescence issues. Spiral developments have modernized the aircraft systems, which include capabilities for an IP-based SCI network, improved electronic intelligence (ELINT) and communications intelligence (COMINT) collection, multi-platform geo-location, advanced special signals collection, information warfare (IW)/information operations (IO), and various quick-reaction capabilities (QRCs) developed for *Operations Enduring Freedom* and *Iraqi Freedom*. The aircraft is also equipped with forward-looking infrared (FLIR) and remote reach-back capabilities to satisfy critical operational requirements. In order to ensure EP-3E relevance beyond FY 2020, the aircraft have received ISR Task Force modifications and continue to incorporate QRCs in response to critical warfighter demands. Recapitalization capa-

bilities migration (RCM) will allow development of the EP-3E and vital testing of equipment for the next generation of intelligence surveillance reconnaissance and targeting (ISR&T) platforms. The JCC Spiral 3 upgrade allows the EP-3E to pace the enemy threat by providing faster, more precise geo-location capability and allowing for better precision targeting, indications and warning (I&W), and direct-threat warning (DTW) against our adversaries' rapidly developing technology. It also shortens the kill-chain and reduces risk of fratricide. The first JCC Spiral 3 aircraft was delivered to the fleet in the summer 2011 and in early 2012 is deployed.

Developers

L3 Communications	Waco, Texas
Argon	Fairfax, Virginia
Ticom Geomatics	Austin, Texas
Aeronixs	Melbourne, Florida

Other suppliers include: AT&T Government Systems, Vienna, Virginia; BAE, Nashua, New Hampshire; CACI, Fairborne, Ohio; Delex, Vienna, Virginia; ITT, Thousand Oaks, California; Lockheed Martin, Denver, Colorado; Northrop-Grumman, Baltimore, Maryland; Raytheon Technical Services, Indianapolis, Indiana; Rockwell-Collins, Cedar Rapids, Iowa; SAIC, San Diego, California; Zeta Corp, Fairfax, Virginia; Fleet Support Team, Jacksonville, Florida; NAWC Aircraft Division, Patuxent River, Maryland; NAWC Weapons Division, China Lake, California; Navy Research Labs, Chesapeake, Maryland; NSWC Crane, Crane, Indiana, NSWC Dahlgren, Dahlgren, Virginia; and SPAWAR/NIWA, San Diego, California

Fixed Surveillance Systems (FSS)

Description

FSS consists of the Sound Surveillance System (SOSUS), the Fixed Distributed System (FDS), and the FDS-C, which is a commercial-off-the-shelf (COTS) version of FDS. FSS provides threat location information to tactical forces and contributes to an accurate maritime picture for the joint force commander. Due to its strategic positioning and long lifetime, it provides indication and warning of hostile maritime activity before conflicts begin. FSS comprises a series of arrays deployed on the ocean floor in deep-ocean areas, across straits and other chokepoints, or in strategic shallow-water littoral areas. The system has two segments: the integrated common processor (ICP), which handles the processing, display, and communication functions; and the underwater segment, which consists of SOSUS, a long array of hydrophones, and FDS, 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 provides a much more cost-effective FDS-caliber system to meet the Fleet's ongoing needs for long-term undersea surveillance.

Status

SOSUS, FDS and FDS-C processing have been upgraded with the integrated common processor (ICP).

Developers

Multiple sources.

Large-Displacement Unmanned Vehicle (LDUUV)

Description

The Large-Displacement UUVs (LDUUVs) will provide the autonomous capability to deploy and manage a variety of sensors and payloads. The Office of Naval Research (ONR) is leading efforts to achieve the power and energy density necessary to extend LDUUV endurance and to develop the autonomy algorithms to perform extended, safe operations at sea.

Status

The LDUUV developmental effort is an ONR Innovative Naval Prototype (INP), scheduled for completion in 2017. The Navy is coordinating LDUUV Program of Record (POR) development with the Naval Sea Systems Command developing the LDUUV acquisition plan to achieve an active squadron of vehicles early in the next decade. ONR has submitted Broad Area Announcements (BAAs) requesting industry input into UUV development in the areas of autonomy and endurance technologies to support INP development. The Navy will achieve a Limited Operational Capability (LOC) for LDUUV by 2015, with the establishment of an LDUUV squadron early in the next decade. The LOC will be achieved by transfer of ONR user operational system for Concept of Operations (CONOPs) and program development.

Developers

To be determined.

MQ-4C Broad Area Maritime Surveillance Unmanned Aircraft System (BAMS)

Description

The MQ-4C BAMS (UAS is integral to the recapitalization of Navy's airborne intelligence, surveillance, and reconnaissance (ISR) capability inherent in the maritime patrol and reconnaissance force (MPRF). BAMS UAS on-station persistence enables unmatched maritime domain awareness (MDA) by sustaining the maritime common operational picture (COP) for surface warfare, overseas operations, and homeland defense. The system will act as a trip wire for surge forces, enhancing situational awareness of the battlespace, and shortening the sensor-to-shooter kill chain. In its ISR role, it will support decision-superiority precision and mobility while providing data and communication relay services that "net" the battlespace.

BAMS UAS is a long endurance-class UAS that will operate from five land-based sites around the world. BAMS UAS will be co-located with the in-service P-3 aircraft, the P-8A when operational, or the U.S. Air Force's RQ-4B Global Hawk. Because BAMS UAS and the P-3/P-8A have related and complementary missions, co-location will enhance manpower, training, and maintenance efficiencies. Additionally, the Navy is pursuing BAMS UAS operational, training, and production commonalities with the RQ-4B Global Hawk. The concept of operations (CONOPS) includes orbits of up to four air vehicles providing persistent ISR 24 hours

a day, seven days a week, out to ranges of 2,000NM. Worldwide access is achieved by providing coverage over high-density sea lanes, littorals, and areas of national interest from its operating locations.

Status

The BAMS UAS Analysis of Alternatives (AoA), Operational Requirements Document (ORD), Capability Development Document (CDD), and initial CONOPS are complete. Milestone B was achieved in April 2008. The System Development and Demonstration (SDD) was initiated in August 2008. Milestone C is scheduled for 2013, and IOC is expected in FY 2016.

Developers

Prime: Northrop Grumman, Bethpage, New York; Hollywood and Baltimore, Maryland; Norwalk, Connecticut; Rancho Bernardo and Palmdale, California; and Moss Point, Mississippi.
Supporting: Vought Aircraft Industries, Dallas, Texas; L3 Communications, Salt Lake City, Utah; Raytheon, Falls Church, Virginia and McKinney, Texas; Rolls Royce, Indianapolis, Indianan; Sierra Nevada Corporation, Nevada; Aurora Flight Sciences, West Virginia; and Curtiss-Wright, California.

MQ-8 *Fire Scout* Vertical Takeoff and Landing Tactical Unmanned Aerial Vehicle (VTUAV)

Description

The *Fire Scout* vertical takeoff and landing unmanned aerial vehicle (VTUAV) is a key pillar in the Navy's airborne ISR family of systems (FoS) construct, with specific emphasis on support to irregular warfare capabilities and missions. The VTUAV is designed to operate (conduct launch, recovery, and mission C2 functions) from the Littoral Combat Ship (LCS) and other air-capable ships, as well as land-based sites for expeditionary operations and support to Special Operations Forces (SOF). *Fire Scout* provides day and night real-time intelligence, surveillance, and reconnaissance; target acquisition; voice communications relay; and battlefield management capabilities to a tactical commander. It is operated and maintained by members of a composite VTUAV/MH-60R or VTUAV/MH-60S aviation detachment at sea. Efforts are underway to add a radar and integrate a weapon in response to U.S. Central Command urgent operational needs.

Status

Fire Scout will execute a quick-reaction assessment (QRA) aboard USS Simpson (FFG 56) in FY 2012. This will lead to an operational deployment on USS Simpson in January that will provide a Joint Urgent Operational Needs (JUONS) requested maritime support to the U.S. Special Operations Command (SOCOM). Subsequent to USS Simpson QRA, operational testing will be conducted aboard USS Klakring (FFG 42) during the second quarter FY 2012. Initial operational capability will follow in mid/late-FY 2012. Testing and integration on LCS platforms will complete in FY 2012. *Fire Scout* is funding efforts to add a maritime radar and weapon capability

to support LCS IOC planned for FY 2013. *Fire Scout* has also been deployed to Kunduz, Afghanistan since April 2011. The detachment is flying over 300 hours per month and providing tactical full-motion video support to U.S. and coalition ground forces. The Navy is developing a rapid-deployment capability to provide VTUAV with increased range, endurance, and payload capacity to support SOF and other emergent missions.

Developers

Northrop Grumman	San Diego, California
Schweizer Aircraft Corporation	Big Flats, New York

Navy Unmanned Combat Aircraft System Demonstration (UCAS-D)

Description

The Navy Unmanned Combat Air System Demonstration (UCAS-D) evolved from the Joint Navy/Air Force development program, J-UCAS. The 2006 Quadrennial Defense Review and other program decisions restructured the J-UCAS program to initiate development of an "unmanned longer-range carrier-based aircraft...to provide greater standoff capability...and increase naval reach and persistence." The UCAS-D air vehicles will carry neither weapons nor be operational, as they will not include any mission systems or sensors. Critical technological risks addressed by UCAS-D are landing unmanned low-observable shapes aboard ships, and establishing the digital messaging and network architecture with associated ship modifications to support accomplishment of this objective. UCAS-D serves as an essential risk-reduction effort to achieve the appropriate Technology Readiness Level (TRL-6) for transition to the Unmanned Carrier-Launched Airborne Surveillance and Strike (UCLASS) development program.

Status

The Navy is exploring the capabilities required for a future unmanned, carrier based aircraft that could conduct intelligence, surveillance, and reconnaissance and some precision strike missions. J-UCAS program management and associated technologies were transferred to the Navy in August 2006. The initial efforts in the N-UCAS program are to demonstrate critical technologies for a carrier suitable low observable air vehicle in a relevant environment and to conduct automated air refueling (AAR) demonstrations. On August 1, 2007, Northrop Grumman Systems Corporation was awarded the UCAS-D contract. Demonstration areas for shipboard operations include catapult launches, arrested landings, and flight in the vicinity of an aircraft carrier (CVN). Two air vehicles have been built for the UCAS-D and the first flight of Air Vehicle #1 took place on February 4, 2011. Carrier operations are to be conducted with both air vehicles in FY 2012. The AAR efforts will be conducted with Air Vehicle #2 after the CVN demonstration.

Developers

Northrop Grumman Systems Corporation	El Segundo, California

Persistent Littoral Undersea Surveillance (PLUS) System

Description

PLUS is an advanced, non-acquisition user operational evaluation system (UOES) to detect and localize submerged targets. This transitions the PLUS system to the fleet. PLUS includes a cluster of netted unmanned underwater vehicles (UUVs) providing passive detection capability. A subsequent spiral will add UUVs with the Integrated Precision Underwater Mapping Array (iPUMA), providing an active search capability. Funding will allow the transition of a prototype system into the fleet.

Status

PLUS is completing developmental testing under the direction of the Office of Naval Research (ONR). There have been two at-sea tests that demonstrated the required capability and provided information on further refinements prior to fleet delivery. A fleet demonstration is being planned for late-FY 2012/early-FY 2013. The system is scheduled to transition from ONR to OPNAV in FY 2013 as a UOES. Concepts of Operations (CONOPS) are being developed by OPNAV, Naval Sea Systems Command, Commander Fifth Fleet, U.S. Fleet Forces Command, and the Naval Oceanographic Office.

Developers

To be determined.

RQ-7B *Shadow* Marine Corps Tactical Unmanned Aircraft System (MCTUAS)

Description

The RQ-7B *Shadow* is an expeditionary Group 3 unmanned aircraft system (UAS) integral to the Marine Aircraft Wings. The *Shadow* provides dedicated tactical reconnaissance, surveillance, target acquisition, target laser designation, and communications relay in support of Marine Air-Ground Task Force (MAGTF) and maritime control operations. Each individual *Shadow* system consists of two ground control stations, four air vehicles, a pneumatic-hydraulic launcher, and support equipment. Each air vehicle is equipped with a full motion video (FMV) electro-optical/infrared (EO/IR) camera with an integral laser pointer/designator and a dedicated communications relay package for ground support. Three active-duty Marine Corps Unmanned Air Vehicle (VMU) squadrons and one reserve component squadron provide organic UAS multi-mission capability to the Marine Expeditionary Force/Joint Task Force (MEF/JTF) commander. Each VMU squadron operates three RQ-7B systems that are task-organized to operate independently as separate detachments in distributed operations.

Status

The RQ-7B *Shadow* is a U.S. Army Acquisition Category (ACAT) 2 program. As lead Service, the Army provides configuration management, training, RDT&E (Research, Development, Testing, and

Evaluation), and production contracting support to the Navy/USMC team. By maintaining a common RQ-7B configuration, all services are able to realize programmatic economic efficiencies. The fielded USMC *Shadow* systems are scheduled to receive several technical upgrades in FY 2011-2013. These upgrades include a tactical common data link (TCDL), a digital universal ground control station (UGCS), and an air vehicle wing modification to increase endurance. Additionally, USMC RQ-7B systems will serve as the air vehicle platforms for a wide-angle augmentation system (WAAS) payload field user evaluation scheduled for early 2012.

Developers

AAI — Hunt Valley, Maryland

RQ-21 Small Tactical Unmanned Aircraft System (STUAS)

Description

The Small Tactical Unmanned Aircraft System (STUAS) is a Group 3 organic asset for Navy Special Warfare (NSW) and LSD 41-class ships to provide tactical intelligence, surveillance, and reconnaissance (ISR) capability. Sensors include an Electro-Optic/Infrared (EO/IR) camera with laser range finder and illuminator, communications relay (land-based version), and Automatic Identification System (AIS) (shipboard version) capability. Four systems are planned: three for NSW detachments and one for LSD 41-class ships. A system consists of five vehicles, one (ship) or two (shore) ground control station(s), launch-and-recovery equipment, spares, and government-furnished equipment.

Status

The STUAS Capability Development Document is complete. Milestone B was achieved in July 2010 and the Engineering Manufacturing and Development phase initiated in August 2010. Milestone C is scheduled for the first quarter FY 2013 and initial operational capability is expected in the fourth quarter FY 2013. The Insitu Integrator (designated RQ-21A) was selected as the STUAS vehicle. Integrator is a 75-pound/16-foot wingspan vehicle (135 pounds fully loaded) capable of 12-15 hours endurance, 55 knots, at greater than 15,000 feet altitude.

Developers

Insitu, Inc. — Bingen, Washington

Tactical Control System (TCS)

Description

TCS is the ground station software operating system for the MQ-8B *Fire Scout* Vertical Takeoff and Landing Tactical UAV (VTUAV) Program. The software provides a full range of scalable unmanned aircraft system (UAS) capabilities from passive receipt of air vehicle and payload data to full air vehicle and payload command and control from ashore and afloat control stations. TCS is designed to control simultaneously multiple UAS aircraft and has

successfully demonstrated that capability. TCS has the potential to be the common operating system for the Broad Area Maritime Surveillance (BAMS) UAS and Small Tactical UAS (STUAS) programs, providing interoperability and commonality for mission planning, command and control, and C4I interfaces. It is compliant with NATO Standardization Agreement (STANAG) 4586 for UAS interoperability.

Status

As part of the *Fire Scout* VTUAV Program, TCS is completing development, and will achieve initial operational capability with the Fire Scout VTUAV in FY 2012.

Developers

System Integrator, Raytheon Systems Inc. Falls Church, Virginia

Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) System

Description

In FY 2009, the Office of the Chief of Naval Operations (OPNAV) conducted the Power Projection from the Sea (PPftS) Capabilities Based Assessment. It identified gaps in persistent sea-based intelligence, surveillance, and reconnaissance (ISR) with precision strike across the Range of Military Operations (ROMO). Concurrently, Combatant Commander (COCOM) Integrated Priority Lists (IPL) identified a high-priority need for added ISR. The Navy in FY 2012 began development of a carrier-based, unmanned air system (UAS) to provide ISR with precision strike capability to close these gaps (UCLASS).

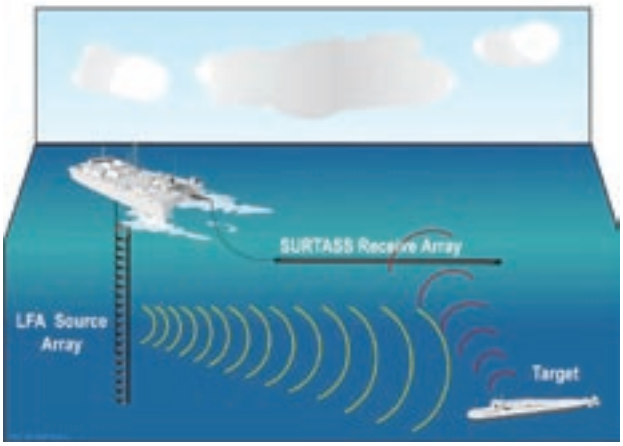
The UCLASS System is expected to enhance carrier versatility through integration of 4-8 unmanned air vehicles (UAVs) into a carrier air wing (CVW) enabling a single carrier to conduct "24/7" operations (ISR, targeting, strike, bomb damage assessment). The UCLASS will be able to operate from CVN-68 and CVN 78-class aircraft carriers. The UCLASS System comprises an air vehicle segment (airframe, ISR payloads, mission systems, and weapons integration), a control and connectivity segment, a support segment, and a carrier integration segment. Affordability is the focus for UCLASS System with incremental growth capability designed in up-front. The UCLASS System will interface to existing shipboard and land-based processing, exploitation, and dissemination systems. The scope of the effort includes design, development, integration, test, and training. The program is structured to match program resources to Navy funding objectives with the goal of delivering an initial operational capability in 2019 and a deployed operational capability in 2021.

Status

FY 2012 represents a new-start budget submission. An Initial Capabilities Document was approved in a Joint Requirements Oversight Council Memorandum on June 9, 2011. The Undersecretary of Defense for Acquisition, Technology, and Logistics (AT&L) authorized entry into the Materiel Solutions Analysis phase for the UCLASS program in an Acquisition Decision Memorandum

on August 11, 2011. The UCLASS will complete an Analysis of Alternatives in 2012 that will recommend the preferred course of action.

Developers
To be determined.



UQQ-2 Surveillance Towed Array Sensor System (SURTASS)

Description
The Surveillance Towed Array Sensor System (SURTASS) capability consists of a fleet of five ships that provide passive detection of quiet nuclear and diesel-electric powered submarines and real-time reporting to theater commanders and operational units. SURTASS employs the TL-29A twin-line passive acoustic towed array, which offers significant passive detection capability for undersea surveillance operations in both deep-ocean and shallow water littoral environments using directional noise rejection and a bearing ambiguity resolution capability.

Status
Five SURTASS vessels are operational in the Pacific fleet in early 2012. All SURTASS vessels have TL-29A twin line arrays. SURTASS is also being upgraded with the integrated common processor (ICP), which will result in increased operator proficiency, increased functionality, and savings in logistics support and software maintenance.

Developers
Lockheed Martin — Syracuse, New York; Manassas, Virginia

WQT-2 SURTASS/Low Frequency Active (LFA)

Description
The LFA system is the active adjunct to the Surveillance Towed Array Sensor System (SURTASS) sonar system. LFA consists of a surface ship-deployed vertical-source array with active transducers deployed from a center well hatch, power amplifiers, and an array-handling system. It uses the SURTASS passive array as the receiver and is capable of long-range detections of submarine and surface ship contacts. As a mobile system, SURTASS/LFA can be employed as a force-protection sensor wherever the force commander directs, including forward operating areas or in support of carrier strike group and expeditionary group operations.

Status
One LFA system is installed onboard USNS Impeccable (T-AGOS 23). The Compact LFA (CLFA) system, employing smaller and lighter sources, has been installed on USNS Able (T-AGOS 20) and USNS Effective (T-AGOS 21), and will be installed on USNS Victorious (T-AGOS 19) in 2012.

Developers
BAE Systems — Manchester, New Hampshire

ELECTRONIC AND CYBER WARFARE

Airborne Electronic Attack

Description

The Next-Generation Jammer (NGJ) is the replacement for the aging ALQ-99 Tactical Jamming System (TJS). ALQ-99, the only airborne TJS in the DoD inventory, is facing obsolescence and cannot counter all current much less future threats. NGJ will address those evolving threats and fill the capability gaps that the aging ALQ-99 TJS cannot fulfill. NGJ will be a full-spectrum jammer, developed in block increments, and will initially be fielded on the EA-18G *Growler*. NGJ will be the prime contributor for the airborne electronic attack mission.

Status

NGJ, a pre-MDAP program, is in the technology maturation phase. The program continues to pursue aggressive development of a flexible stand-off jamming capability that greatly surpasses ALQ-99 in both performance and ability.

Developers

BAE Systems	Nashua, New Hampshire
ITT	Clifton, New Jersey
Northrop Grumman Systems Corporation	Bethpage, New York
Raytheon	Goleta, California

Joint Counter Radio-Controlled Improvised Explosive Device (RCIED) Electronic Warfare (JCREW)

Description

Improvised explosive devices (IEDs) present a significant threat to United States and coalition forces throughout the world and across the full range of military operations. The Counter Radio-Controlled IED Electronic Warfare (CREW) program encompasses all of the mobile, man-portable, and fixed-site protection systems employed to counter IEDs that are either armed or initiated by radio-command signals. Fielded first- and second-generation CREW systems were acquired largely by non-developmental urgent operational need initiatives to address immediate warfighter requirements.

Joint CREW (JCREW) is currently a Navy-led program to develop the next generation of Joint-service CREW systems. JCREW will deliver capabilities that correct deficiencies in existing CREW systems and address future worldwide RCIED threats. Additionally, JCREW has an open architecture, allowing evolution as new threats, advances in technology, and new vehicle requirements are introduced.

Status

Navy will continue as lead through the development of block two of the initial capability, integrating Army requirements into that delivery. Army will then take lead as the executive agent and incorporate the JCREW capability into their integrated Electronic Warfare Sys-

tem (EWS). JCREW is expected to reach initial operational capability in 2013.

Developers

ITT Electronic Systems	Clifton, New Jersey
	Thousand Oaks, California

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 (ASCMs). The Nulka decoy employs a broadband radio frequency repeater mounted on a hovering rocket platform. After launch, the Nulka decoy radiates a large, ship-like radar cross-section and flies a trajectory that seduces incoming ASCMs away from their intended target. Australia developed the hovering rocket, launcher, and launcher interface unit. The U.S. Navy developed the electronic payload and fire control system. The in-service Mk 36 Decoy Launching System (DLS) has been modified to support Nulka decoys and is designated the Mk 53 DLS.

Status

Nulka received Milestone III approval for full-rate production in January 1999. Installation began on U.S. and Australian warships in September 1999. As of late 2011, the system is installed on U.S. Coast Guard cutters and more 120 U.S. Navy ships.

Developers

BAE Systems	Edinburgh, Australia
SECHAN Electronics Inc.	Lititz, Pennsylvania
Lockheed Martin Sippican	Marion, Massachusetts

SSQ-130 Ship Signal Exploitation Equipment (SSEE) Increment F

Description

The Shipboard Information Warfare Exploit (SIWE) program provides improved situational awareness and near real-time indications and warnings to the warfighter by improving and increasing tactical cryptologic and information warfare exploitation capabilities across Navy combatant platforms. The SSQ-130 SSEE Increment F is a shipboard Information Operations (IO)/Electronic Warfare (EW) system that provides commanders with automatic signal acquisition, direction finding, and target geolocation. SSEE provides deployed forces with an afloat IO/IW/EW system/sensor. SSEE is a commercial-off-the-shelf (COTS)/non-developmental item (NDI) program that is easily reconfigured, and therefore able to respond rapidly to emergent taskings in evolving threat environments. The system design permits the rapid insertion of new and emerging technologies that will integrate capabilities from existing systems and advanced technologies into a single, scalable, spirally developed, interoperable system.

Status
SSEE Increment E is no longer in production and is expected to attain final operational capability in FY 2012 with the last afloat installation. As of August 2011, SSEE Increment F entered full rate production of the acquisition cycle with an inventory objective of 70 systems.

Developers

Argon-ST	Fairfax, Virginia

Surface Electronic Warfare Improvement Program (SEWIP)

Description
SEWIP is an evolutionary development block upgrade program for the SLQ-32 electronic warfare (EW) system installed on numerous U.S. Navy aircraft carrier and surface and amphibious warships, as well as Coast Guard cutters, with total National Fleet-wide population of 170 systems in late 2011. Block 1A replaces the SLQ-32 processor with an electronic surveillance enhancement processor and the display console with a UYQ-70. Block 1B also improves the human machine interface of the SLQ-32 and adds specific emitter identification (SEI) capability that provides platform identification. The high-gain high sensitivity (HGHS) receiver (Block 1B3) provides improved situational awareness through non-cooperative detection and identification of platforms beyond radar horizon. Block 2 provides improvements to the electronic support (ES) receiver; planned Block 3 provides improvements for electronic attack (EA) transmitter; and future Block 4 provides improvements to address Electro-Optic/InfraRed (EO/IR). SEWIP will also cue Nulka decoy launch.

Status
SEWIP was established as an ACAT II program in July 2002 after cancellation of the Advanced Integrated Electronic Warfare System (AIEWS). SEWIP Block 2 contract was awarded September 30, 2009 to develop an upgraded antenna, receiver, and combat system interface as a new variant of the SLQ-32. Upgrades provide capability to pace the threat, improving detection, measurement accuracies, classification, and mitigation of electromagnetic interference. SEWIP Block 3's advanced active Electronic Attack (EA) capabilities are in development and will provide integrated softkill countermeasures against RF guided threats and extends frequency range coverage. Milestone B is scheduled for early 2013. Development is expected to complete in 2016 followed by first production deliveries in the 2017 timeframe.

Developers

Northrop Grumman PRB Systems	Goleta, California
Lockheed Martin	Eagan, Minnesota
General Dynamics Advanced Information Systems	Fairfax, Virginia
Lockheed Martin	Liverpool, New York

DECISION SUPERIORITY

Advanced Tactical Data Link Systems (ATDLS)

Description

ATDLS provides tactical data link (TDL) command and control (C2) for U.S. forces, allies, and coalition partners in accordance with the Joint Tactical Data Enterprise Services Migration Plan (JTMP), the DoD roadmap for TDL implementation. ATDLS sustains and improves existing networks while developing future networks. Joint TDLs (Link-11, Link-16, and Link-22) include terminals, gateways, networks, and support initiatives that improve connectivity, interoperability, training, and support. Link-16 is DoD's primary TDL implemented to most TDL-capable platforms and some munitions for specific applications. Link-22 is a multi-national development effort replacing Link-11 with a more suitable High Frequency (HF) protocol using a message standard similar to Link-16.

Terminals include the Joint Tactical Information Distribution System (JTIDS) and Multifunctional Information Distribution System (MIDS), which provide a Link-16 capability for Command and Control (C2) aircraft, ships, and ground sites. MIDS-Low Volume Terminal (MIDS-LVT) is a joint and multi-national cooperative program to develop, produce, and sustain a successor terminal to JTIDS and is the most widely employed Link-16 terminal. MIDS is the core for MIDS On Ship (MOS). The U S serves as MIDS-LVT program leader, with France, Germany, Italy, and Spain as full partners. Dynamic Network Management (DNM) increases Link 16 network efficiency and reconfiguration flexibility. MIDS Joint Tactical Radio System (JTRS) is an Engineering Change Proposal of the MIDS-LVT and fully interoperable with JTIDS and MIDS-LVT providing Link-16, TACAN, J Voice and three channels for future scalability.

Gateways include the Command and Control Processor (C2P), the Air Defense System Integrator (ADSI), and the Link Monitoring and Management Tool (LMMT). C2P is a TDL communication processor associated with host combat systems (such as Aegis or Ships Self Defense System (SSDS) Next-Generation C2P (NGC2P) deliver extended functionality of C2P provide improved Human Machine Interface (HMI) and adds Link maintenance, NGC2P uses an incremental approach for capability enhancements, and technology refreshment of obsolescent components. Common Data Link Management System (CDLMS) integrates components to monitor multi-TDL networks simultaneously. ADSI is a near real-time tactical command and control (C2), commercial off-the-shelf (COTS) system providing for processing and display of multiple TDL interfaces, data forwarding, and TDL information to the Global Command and Control System–Maritime (GCCS-M). LMMT is a prototype effort to meet network monitoring management and communications requirements for the Maritime Operations Center (MOC) C2 Ballistic Missile Defense (BMD) Forces by addressing the shortcomings of existing systems such as ADSI.

Status

JTIDS/MOS: JTIDS/MOS terminals will be updated for cryptographic modernization and frequency remapping with an initial operational capability (IOC) of FY 2016. DNM: Time Slot Reallocation (TSR) achieved IOC on ships in the C2P and JTIDS programs in FY 2007. TSR was also fielded on USN E-2C, EA-6B, and H-60 platforms in FY 2009, and is scheduled to field on other joint platforms such as E-3 and E-8. DNM is scheduled for Milestone (MS) C/Full Deployment Decision Review (FDDR) and IOC in FY 2013, and FOC in FY 2014.

MIDS-LVT: Within the Navy, MIDS is being procured in 2012 and through the FYDP for F/A-18 C/D/E/F, E/A-18/G, MH-60R/S, and CH-53K aircraft. The Air Force F-15 fighter variant, is fully fielded, and the Army variant, is deployed with all designated Army units. Block Upgrade 2 (BU2) configuration for MIDS LVTs commence in FY 2016 to incorporate cryptographic modernization, frequency remapping, and enhanced throughput. Over 8,100 MIDS-LVTs have been delivered or on contract serving 76 platforms with MIDS-LVT partners and 39 foreign military sales nations.

MIDS JTRS: MIDS JTRS is currently undergoing operational testing on aboard the F/A-18E/F. MIDS JTRS full production and fielding is planned for the second quarter FY 2012, with IOC in the F/A-18E/F planned for the third quarter of FY 2012.

C2P: C2P Legacy, C2P Rehost, and NGC2P Increment 1 have completed fielding and are in the operations and support (O&S) phase. NGC2P Increment 2 achieved full rate production 2008. NGC2P Increment 3 is funded to begin development in FY 2013. NGC2P Increment 4 is unfunded.

ADSI: ADSI Version 14 is in fielding. ADSI Version 15 is in development and planned for limited fielding beginning in FY 2014.

Developers

Data Link Solutions (East):	BAE Systems Wayne, New Jersey
Data Link Solutions (West):	Rockwell Collins, Cedar Rapids, Iowa
DRS Inc.	Wyndmoor, Pennsylvania
EUROMIDS	Paris, France
Northrop Grumman	San Diego, California
SPAWARSYSCEN Pacific	San Diego, California
Ultra Electronics	Austin, Texas
ViaSat	Carlsbad, California
Warner Robins Air Logistics Center	Warner Robins, Georgia

Automatic Identification System (AIS)

Description

The Automatic Identification System (AIS) is a maritime digital broadcast system that continually exchanges voyage and vessel data among network participants over VHF radio frequency, in support of regional and global maritime domain awareness (MDA) requirements. The data includes vessel identity, position, speed, course, destination, and other data of critical interest for navigation safety and maritime security. International commercial vessels greater than a specified gross tonnage (GT)—300 GT in 2012—are mandated by the International Maritime Organization (IMO), International Convention for the Safety of Life at Sea (SOLAS) 1974 Treaty to use AIS. Warships are exempt. The Navy AIS program collects open-source AIS data that is being broadcast from AIS transceivers on commercial shipping vessels. This open source AIS data, combined with other government intelligence and surveillance data, is used by Navy ships and submarines to improve safety of navigation and is integrated into the common operational picture (COP) to enhance situational awareness. The AIS data collected by Navy platforms is also aggregated within the Maritime Domain Awareness (MDA)/AIS, Sensor/Server (MASS) capability at several operational shore sites. The MASS then provides the data to unclassified and classified users in support of MDA efforts, with particular focus on improving the Nation's maritime security.

Status

AIS, initiated as a rapid deployment capability (RDC), transitioned to a program of record on December 24, 2008 and was designated as an Acquisition Category (ACAT) IVT program. PEO C4I is the Milestone Decision Authority. As of early 2012, Increment I AIS systems have been installed on 146 unit-level ships (e.g., cruisers and destroyers) and provide basic AIS capability, including a laptop computer display on the bridge and connectivity to send unclassified AIS data to shore sites. AIS Increment I systems have also been installed on 23 force-level ships (aircraft carriers and amphibious assault ships), which, in addition to the basic capability, allow for the direct transfer of AIS track information to the Global Command and Control System (GCCS). An additional seven unit-level ships will be retrofitted with AIS. AIS installations have been completed on nine submarine platforms through FY 2011. There is a plan to complete AIS retrofit installations on 38 additional submarine platforms through FY 2018. AIS shore sites are currently operational at Second, Third, Fifth, and Pacific Fleet. The AIS shore site at Second Fleet will move to Fleet Forces Command in FY 2012.

Developers

L-3 Communications	Orlando, Florida
Sperry Marine, Northrop Grumman Electronic Systems	Charlottesville, Virginia
Scientific Research Corporation	Charleston, South Carolina
SPAWAR Systems Center Atlantic	Charleston, South Carolina

Cooperative Engagement Capability (CEC)

Description

CEC provides improved battle force air-defense capabilities by integrating sensor data of each cooperating ship and aircraft into a single, real-time, fire-control-quality, composite track picture. CEC is a critical pillar of the Naval Integrated Fire Control-Counter Air (NIFC-CA) capability and will provide a significant contribution to the Joint Integrated Fire Control (JIFC) operational architecture. CEC interfaces the weapons capabilities of each equipped ship and aircraft in the strike group to support integrated engagement capability. By simultaneously distributing sensor data on airborne threats to each ship within a strike group, CEC extends the range at which a ship can engage hostile tracks to beyond the radar horizon, significantly improving area, local, and self-defense capabilities. CEC enables a strike group or joint task force to act as a single, geographically distributed combat system. CEC provides the fleet with greater defense in-depth and the mutual support required to confront evolving threats of anti-ship cruise missiles and theater ballistic missiles.

Status

IOC for the shipboard CEC system (AN/USG-2) was declared in FY 1996. AN/USG-2 technical and operational testing was successfully completed between 1998-2001 and declared ready for fleet use. In April 2002, the Defense Acquisition Board (DAB) approved full rate production for AN/USG-2 shipboard and low rate initial production for E-2C Hawkeye (AN/USG-3) airborne equipment sets. In September 2003, USD (AT&L) approved FY 2004/2005 follow on production for the AN/USG-3. CEC systems are at sea in 57 ships and 26 E-2C Hawkeye aircraft. Total future CEC installation is planned for 281 ships, aircraft, and land units. The acquisition strategy implements a pre-planned product improvement (P3I) incorporating open architecture-based hardware with rehosted existing software. The P3I hardware supports reduced cost, weight, cooling, and power objectives and is more extensible to other services. This initiative culminated in the competitive design and production of the CEC Signal Data Processor (SDP), which is installed on several land-based test sites, DDGs, and the E-2D Hawkeye, and is proceeding through testing. Navy has coordinated with the Joint Staff, OSD, and other Services to explore potential multi-Service avenues for CEC capability. This effort has resulted in the implementation of CEC into ground mobile systems including the Marine Corps' Composite Tracking Network (CTN) and the Army's Joint Land-Attack Cruise Missile Defense Elevated Netted Sensor (JLENS), and work is under way to create a bridge to the Army Integrated Fire Control (IFC) program. The SDP has been re-designed to incorporate NSA mandated crypto-logic modernization changes. The crypto-modified SDP (SDP-S) hardware and software have passed Critical Design Review and NSA certification. The SDP-S has been integrated into the E-2D Advanced Hawkeye and will undergo FOT&E during the E-2D OPEVAL in 2012.

Developers

Johns Hopkins University Applied Physics Laboratory	Laurel, Maryland
Raytheon Systems Company	St. Petersburg, Florida
Sechan Electronics Inc.	Lititz, Pennsylvania

Defense Messaging System (DMS)/Command and Control Official Information Exchange (C2OIX)

Description

The Assistant Secretary of Defense designated DMS as the messaging system of record for the DoD and supporting agencies for Command, Control, Communications, and Intelligence (ASD C3I). DMS is based on Joint Staff-approved requirements as defined in the Multi-command Required Operational Capability (MROC). It is a flexible COTS-based, network-centric application layer system, which provides multi-media messaging and directory services capable of taking advantage of the flexible and expandable underlying Defense Information Infrastructure (DII) network and security services. The Navy's implementation is the DMS ACAT IVM program comprised of the Navy Regional Enterprise Message System (NREMS) and the Certificate Authority Workstation (CAW) servicing U.S. Navy and Coast Guard organizations.

Status

In 2005, the Assistant Secretary of Defense for Networks and Information Integration (NII) placed DMS in sustainment through FY 2012. DoD Chief Information Officer (CIO) guidance directed the services to find alternate means and technologies to process organizational messages while maintaining DMS funding until a post-DMS roadmap is defined. The Navy intends to consolidate and eliminate DMS for organizational messaging using a phased approach.

In FY 2011, the Navy shut down its unclassified DMS architecture. All unclassified non-C2 related official information (OI) that historically was transmitted via message traffic is now disseminated via command email or via other transport mechanisms such as portals, wikis, and blogs. C2-related OI will continue to be supported via Secret Navy Regional Enterprise Messaging System (NREMS) until a follow-on solution is developed.

Beginning in FY 2012, the Navy will begin transitioning its shore and afloat components to an IP-based interim solution called Command and Control Official Information Exchange (C2OIX). C2OIX is the Navy's transitional official information exchange system that consolidates and eliminates shore and afloat support systems while facilitating message transfer via IP as the primary, plus failover to alternative mechanisms. Message communications with allied, coalition, and other DoD entities will continue to be supported by existing messaging systems.

Developers

TELOS — Ashburn, Virginia

Deployable Joint Command and Control Capability (DJC2)

Description

Deployable Joint Command and Control (DJC2) provides an integrated C2 headquarters (HQ) equipment suite enabling a Joint Force Commander to set up and operate a scalable and reconfigu-

rable, self-contained, joint task force (JTF) headquarters anywhere in the world within 6-24 hours of arrival in theater.

DJC2 can be employed in operations ranging from first responder or small early-entry, forward-component operations center to full JTF combat operations center. DJC2 has been used for homeland assistance/disaster response operations.

The DJC2 system has four modular tent/mobile shelter configurations which include: an autonomous Rapid-Response Kit (RRK, 5 to 15 seats); En Route (6 to 12 seats carried on board C-130 and C-17 aircraft); Early Entry (20 to 40 seats); and Core (60 seats). The number of users supported can be significantly expanded by lashing together two or more Cores, or by adding Core Expansion Kits (three available, adding 60-seats each).

DJC2 provides Combatant Commands and Joint Force Commanders an operationally 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 autonomous en route and rapid response capabilities
- Spiraling into the design through technology insertion and fielding mature enhancements to current capabilities that maintain technological superiority for combatant and JTF commanders

Status

The DJC2 program attained full operational capability with the delivery of six operational Core systems to U.S. Southern Command, U.S. European Command, U.S. Pacific Command, U.S. Army South, U.S. Army Africa, and III Marine Expeditionary Force. Programmed funding supports hardware sustainment, information technology refresh, and technology-insertion efforts (based on warfighter input as technologies mature) across the FYDP. The first cycles of technology insertion have been successfully delivered and included secure wireless networking and a new variant of the RRK that is more modular and includes a specialized commander's kit. Follow-on cycles of technology insertion are delivering such capabilities as application virtualization. Core Expansion Kits, an early entry light configuration, robust storage architecture, cloud services, voice over secure Internet protocol (VoSIP), and IPv6.

Developers

Naval Surface Warfare Center	Panama City, Florida
Georgia Tech Research Institute	Atlanta, Georgia
ARINC	Panama City, Florida
General Dynamics Information Technology	Panama City, Florida
L-3 Communications	Panama City, Florida
ISPA Technology	Panama City, Florida

Distributed Common Ground System-Navy (DCGS-N)

Description

Distributed Common Ground System-Navy Increment One is the Navy component of the DoD DCGS family of systems. DCGS-N is the Navy's primary intelligence, surveillance, reconnaissance, and targeting (ISR&T) support system, providing processing, exploitation, and dissemination services at the operational and tactical levels of war. DCGS-N operates at the General Services (GENSER) and Sensitive Compartmented Information (SCI) security levels. DCGS-N Increment One is replacing all legacy JSIPS-N (Joint Service Imagery Processing System-Navy) and TES-N (Tactical Exploitation System-Navy) systems.

DCGS-N makes maximum use of commercial-off-the-shelf (COTS), mature government-off-the-shelf (GOTS), and joint services software, tools, and standards to provide a scalable, modular, and extensible multi-source capability that is interoperable with the other Service and Agency DCGS systems.

In 2007, the DCGS-N program was realigned to the CANES Common Computing Environment (CCE)/Afloat Core Services (ACS) architecture. The Increment One follow-on system, DCGS-N Increment Two, planned for FY 2016, will be hosted primarily as software within the CANES infrastructure as part of the Navy's long-term vision for consolidation of C4I networks and services.

DCGS-N Increment Two will build upon the capabilities provided by DCGS-N Increment 1 and Maritime Domain Awareness (MDA) Spiral 1 and converge afloat and ashore ISR into an integrated Information Dominance enterprise. Increment Two will leverage the CANES, DoD, and Intelligence Community (IC) hardware and software infrastructures, including the widget construct and emerging cloud architecture, to ensure the Navy's joint C4ISR interoperability. Increment Two will provide the necessary end-to-end Processing, Exploitation, and Dissemination (PED) architecture to address future sensor data from Navy ISR tactical sensor platform investments. It will greatly improve the Navy's ability to: (1) detect and identify maritime threats; (2) fuse national, tactical, and inter-theater data for operational use; and (3) allow better DCGS family of systems and Intelligence Community visibility into maritime -collection requirements. Increment Two will be a software-centric program that will support evolving fleet needs through early and frequent delivery of capabilities.

Status

The DCGS-N installation plan includes aircraft carriers (CVN), large-deck amphibious assault ships (LHA/LHD), fleet command ships (LCC), intelligence training centers and school house facilities, and at shore-based numbered fleet Maritime Operations Centers (MOC) reach-back support sites. Eleven Increment One exploitation suites are planned for installationin early 2012, with an additional 23 scheduled for installation through FY 2014. Increment Two (software) will be tested and fielded beginning in FY 2016 as part of CANES and will eventually replace all Increment One installations.

Developers

BAE Systems — Rancho Bernardo, California

E-2C/D *Hawkeye* Airborne Early Warning Aircraft

Description

The E-2C *Hawkeye* is the Navy's airborne surveillance and battle management command and control (BMC2) platform, providing support of decisive power projection at sea and over land for the carrier strike group and joint force commanders. In addition to current capabilities, the E-2 has an extensive upgrade and development program to improve the capability of the aircraft as it is a critical element in the joint integrated air and missile defense (IAMD) architecture. To ensure the E-2 keeps pace with changing tactical environments, the Navy is procuring the E-2D *Advanced Hawkeye*.

The E-2D *Advanced Hawkeye*, with the APY-9 radar, is a two-generation leap in technology, which brings an improved over-the-horizon, overland, and littoral detection and tracking capability to the carrier strike group and joint force commanders. The APY-9, coupled with Cooperative Engagement Capability (CEC), Link-16, and the Advanced Tactical Data Link, fully integrates the E-2D *Advanced Hawkeye* into the joint integrated air and missile-defense (IAMD) role. The APY-9's advanced detection and tracking capability, in conjunction with AEGIS and the upgraded Standard Missile as well as the F/A-18 *Hornet* and its upgraded AIM-120 Advanced Medium Range Air-to-Air Missile (AMRAAM), will allow strike groups to deploy an organic, theater-wide air and cruise missile defense capability to protect high-priority areas and U.S. and coalition forces ashore and afloat. E-2D is the key enabler to all kill chains of the Naval Integrated Fire Control–Counter Air (NIFC-CA) capability. The E-2D will continue as the airborne "eyes and ears" of the Fleet.

Status

There are 63 E-2C aircraft in the Fleet as of early 2012. Two E-2D *Advanced Hawkeye* System Development and Demonstration aircraft are in flight test at Patuxent River, Maryland. All three Pilot Production aircraft have been delivered to support testing and initial training, with the Fleet Replacement Squadron receiving their first E-2D on July 29, 2010. Two Low-Rate Initial Production (LRIP) aircraft have been delivered and five others are currently in production in St. Augustine and are meeting all cost, schedule, and performance criteria. A total of four lots of LRIP aircraft are approved for procurement in FY 2009-2012, with delivery scheduled two years after procurement. Full-rate production begins in FY 2013 with an objective of 75 aircraft. The E-2D Developmental Test program was nearly complete in early 2012. The E-2D continues to meet or exceed all Key Performance Parameters. Initial Operational Test and Evaluation will begin in February 2012, and the first fleet squadron will begin transition to E-2D in 2013, with initial operational capability and first deployment planned for the first quarter FY 2015.

Developers

Northrop Grumman	Bethpage, New York
Northrop Grumman	St. Augustine, Florida
Lockheed Martin	Syracuse, New York

E-6B *Mercury*

Description

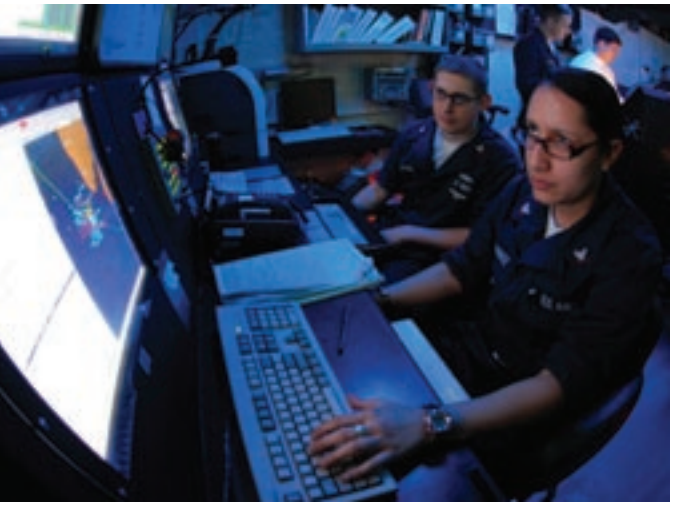
Derived from the Boeing 707, the E-6B platform provides the Commander, U.S. Strategic Command (USSTRATCOM) with the command, control, and communications capability needed for execution and direction of strategic forces. Designed to support a robust and flexible nuclear deterrent posture well into the 21st Century, the E-6B performs VLF emergency communications, the U. S. 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.

Status

The Block I modification program will sustain and improve E-6B capability and is focused on several aircraft deficiencies identified by USSTRATCOM. The contract for Block I was awarded to Rockwell Collins in March 2004. Initial operating capability (IOC) is planned for 2013. In 2005, the Navy initiated the Internet Protocol and Bandwidth Expansion (IP/BE) program to modernize the E-6B platform, and in 2008 directed the Block II program to provide additional enhancements to field a T-3 capability and the replacement of the MILSTAR terminals to connect with the Advanced Extremely High Frequency satellite system. The IP/BE and Block II programs will support USSTRATCOM's migration of Nuclear Command and Control (C2) to a distributed, network/IP-based global C2 system as an airborne node. IP/BE IOC is 2012, and Block II IOC, 2016.

Developers

Boeing	Wichita, Kansas
Rockwell Collins	Richardson, Texas
DRSTinker AFB, Oklahoma	
L3/Link	Arlington, Texas



Global Command and Control System–Maritime (GCCS-M)

Description

Global Command and Control System–Maritime (GCCS-M) is the maritime implementation of the GCCS family of systems (FoS). It supports decision making at all echelons of command with a single, integrated, scalable C4I system that fuses, correlates, filters, maintains, and displays location and attribute information on friendly, hostile, and neutral land, sea, and air forces, integrated with available intelligence and environmental information. It operates in near real-time and constantly updates unit positions and other situational awareness data. GCCS-M also records data in databases and maintains a history of changes to those records. System users can then use the data to construct relevant tactical pictures using maps, charts, topography overlays, oceanographic overlays, meteorological overlays, imagery, and all-source intelligence information coordinated into a common operational picture that can be shared locally and with other sites. Navy commanders review and evaluate the general tactical situation, plan actions and operations, direct forces, synchronize tactical move-

ments, and integrate force maneuver with firepower. The system operates in a variety of environments and supports joint, coalition, allied, and multinational forces. GCCS-M is implemented afloat and at ashore fixed command centers.

Status

The GCCS–M program is designated Acquisition Category (ACAT) IAC with the Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN(RD&A) designated as the Milestone Decision Authority (MDA). GCCS-M is an evolutionary acquisition program with development and implementation progressing in increments. In keeping with Department of Defense regulations for evolutionary acquisition programs, the acquisition strategy calls for each GCCS-M increment (major release) to proceed through acquisition milestone reviews prior to fielding. The program is operating in two simultaneous acquisition increments: GCCS-M Increment 1, formerly known as GCCS-M Version 4.0 and prior, is post-full-rate production; and Increment 2, formerly known as GCCS-M Version 4.1. Increment 2 achieved Milestone C on June 15, 2010. USS Tempest (PC 2) and USS Boxer (LHD 4) received Increment 2 in FY 2010. On August 16, 2011, GCCS-M completed a Full Deployment Review/Configuration Steering Board, which will lead to authorization of full fielding of unit level and force level Increment 2 configurations. GCCS-M includes efforts necessary to ensure synchronization and interoperability with the GCCS FoS.

Developers

SPAWAR Systems Center San Diego, California

Maritime Operations Center (MOC)

Description

The tri-service *A Cooperative Strategy for 21st Century Seapower* states, "At all echelons of command, we must enhance our ability to conduct integrated planning, execution, and assessment." The Navy's Maritime Operations Centers (MOCs) advance the service toward this end state at the operational level of war.

MOCs enhance the Navy's command and control (C2) capabilities at the operational level through headquarters manned by individuals proficient in joint and naval operational-level staff processes and equipped to provide globally networked, scalable, and flexible capability across the spectrum of conflict. MOCs provide organizational consistency, the scalability, and flexibility to transition between various command roles, and enhanced global networking among Navy Component and Numbered Fleet Commanders. The MOC construct achieves effective, agile, networked, and scalable staffs that employ standardized doctrine, processes, and C4I systems. Each MOC will be able to operate in common organizational constructs providing appropriate flexibility to accommodate a spectrum of responsibilities based on the commanders' roles (joint, interagency, combined). The global network and commonality enable both reach-back and load sharing across all MOCs.

Status

Education provided via the Maritime Staff Operators Course provides foundational knowledge in joint and naval operational-level processes. Nine established locations are equipped with the initial MOC baseline systems configuration, including the MOC supporting the Commander, Tenth Fleet and the consolidated MOC (U.S. Second Fleet and U.S. Fleet Forces) supporting the Commander U.S. Fleet Forces Command.

Key MOC baseline systems hardware and software capabilities have been fielded to Third, Fourth, Fifth, Sixth (two locations, afloat and ashore), Seventh (afloat), and Pacific Fleets and U.S. Fleet Forces Command. Systems fielded include the Combined Enterprise Regional Information Exchange System–Maritime (CENTRIXS–M), Air Defense System Integrator (ADSI), Joint Automated Deep Operations Coordination System (JADOCS), Radiant Mercury, Analyst Notebook, Missile Defense Planning System (MIPS), Command and Control Personal Computer (C2PC), Distributed Common Ground System–Navy (DCGS–N) and Global Command and Control System–Maritime (GCCS–M) Sensitive Compartmented Information (SCI). In FY 2012, funding was provided to support the emerging ballistic missile defense (BMD) requirements of the President's Phased Adaptive Approach for BMD in Europe. Enhanced capabilities include installing additional ADSIs at selected MOCs the Command and Control Battle Management Communication (C2BMC) Browser and Planner at most MOCs, and the C2BMC Enterprise Workstation at MOCs that are principally responsible for C2 of navy BMD forces. Training and assist teams from U.S. Fleet Forces Command and the Naval War College provide MOCs on-site training and assessment in order to maintain proficiency in doctrine, execute critical staff processes, and share best practices.

Developers

MOC is designated as a "system-of-systems" (SoS) project and as such does not have a single RDT&E or acquisition budget line to support development and fielding. The MOC SoS Project is responsible for communicating validated mission requirements for OLW C2. Programmed solutions to these MOC C4I SoS requirements must operate on existing or planned Navy C4I Networks and Systems in order to become fully integrated into the Navy's operational C2 capability. There are multiple suppliers.

Mk XIIA Mode 5 Identification Friend or Foe (IFF)

Description

The Mk XIIA Mode 5 Identification Friend or Foe (IFF) is a secure, real-time, cooperative "blue-force" combat identification system designed to inform commanders' "Shoot/No Shoot" decisions. Advanced technology, coding, and cryptographic techniques are incorporated into the IFF Mode 5 to provide reliable, secure, and improved equipment performance compared to Mode 4. The Mode 5 waveform is defined in NATO Standardization Agreement (STANAG) 4193 and is compatible with all U.S. and international civil IFF requirements. This Navy ACAT II program is based on the improved Mk XII Cooperative IFF Operational

Requirements Document, dated April 27, 2001. Transponders will be installed on more than 3,000 ships and Navy/Marine Corps aircraft. Mode 5 interrogator equipment will be fielded on select ships and aircraft, the latter including MH-60R, E-2D, F/A-18 C/D, and F/A-18E/F/G.

Status

Initial operational test and evaluation have been completed. The Navy initial operational capability and the full-rate production decision are expected in the third quarter FY 2012. Joint initial operating capability and final operational capability are scheduled for FY 2014/2020, respectively.

Developers

BAE Systems	Greenlawn, New York
General Dynamics Decision Systems	Scottsdale, Arizona

Navy Air Operations Command and Control (NAOC2)

Description

Navy Air Operations Command and Control (NAOC2) is providing the naval warfighter with the ability to plan, disseminate, monitor and execute theater air battles in support of the task force commander's objectives. NAOC2 capability is satisfied by the Theater Battle Management Core Systems (TBMCS). TBMCS is an Air Force Acquisition Category (ACAT) III Program of Record with Joint-Interest. TBMCS is integrated and fielded by PMW 750 to enable the Air Planner to produce the Joint Air Tasking Order (ATO) and Air Space Control Order (ACO). With the shift to a net-centric environment, Command and Control Air and Space Operations Suite (C2AOS) and Command Control and Information Services (C2IS) will replace TBMCS.

Status

The in-service version of TBMCS 1.1.3 is in the operations and sustainment phase. There are on-going software and security upgrades developed by the Air Force to include Service Packs (SPs), Security Service Packs (SSPs), and major Maintenance Releases (MRs) that are fielded as they become available. No further hardware fielding or upgrades are planned. NAOC2 program office integrates and tests these products within the Navy operational environment for fielding to force-level ships (CVN/LHA/LHD/LCC), Navy Maritime Operations Centers (MOCs), and selected training sites.

NAOC2 will commence fielding additional software-only capabilities to replace TBMCS functionality by taking advantage of Air Force-developed modules produced by C2AOS and C2IS programs of record. Additional modules will be integrated or developed as necessary to ensure the wide range of air planning capabilities are available to the warfighter. The modules will function in a service-oriented architecture environment and will reside on Consolidated Afloat Networks and Enterprise Services (CANES).

Developers

Lockheed Martin (Prime)	Colorado Springs, Colorado

Tactical Mobile

Description

The Navy Tactical/Mobile (TacMobile) Program provides systems to support maritime commanders with the capability to plan, direct, and control the tactical operations of maritime patrol and reconnaissance forces (MPRF), joint and naval expeditionary forces, and other assigned units within their respective areas of responsibility. The TacMobile systems that support these missions are Tactical Operations Centers (TOCs), Mobile Tactical Operations Centers (MTOCs), and Joint Mobile Ashore Support Terminals (JMASTs).

TOCs and MTOCs provide MPRF operational support ashore at main operating bases, primary deployment sites, and forward operating bases. Support includes persistent situational operational and tactical awareness, Maritime patrol and reconnaissance aircraft (MPRA) pre-mission coordination and planning, mission and target briefings, tactical in-flight support, post-mission analysis of collected sensor data, data dissemination, and feedback to aircraft sensor operators and supported commanders. Services include: analysis and correlation of sensor information; data management support; command decision aids; data communication; mission planning, evaluation, and dissemination of surveillance data; and threat alerts to operational users ashore and afloat. As advances in sensor technology are fielded on MPRA, the TOC and MTOC sensor analysis equipment will evolve to support the new sensor capabilities.

JMAST provides a robust and transportable C4ISR capability to a Navy component commander or other staff. JMAST systems have supported overseas contingency operations, humanitarian-assistance and disaster-response (HA/DR) efforts, and non-combatant evacuation operations (NEO), among other critical operations.

Status

TacMobile Increment 2.0 full-rate production and fielding were authorized in June 2009. Increment 2.0, which incorporates warfighter interface capabilities for TOC/MTOC activities plus communication upgrades needed for MTOCs to support P-3C Orion operations, will achieve FOC in FY 2012. Increment 2.1 is in final development and will incorporate P-8A Poseidon Multi-mission Maritime Aircraft (MMA) mission support and systems interfaces as well as critical communications upgrades. Increment 2.1 Milestone C is scheduled for early FY 2012. Analysis are underway to support P-8A Increment 2 engineering change proposals and Broad Area Maritime Surveillance (BAMS) Unmanned Aircraft System (UAS), to achieve more efficient information flow across the Navy's sensor grid through implementation of tactical service-oriented architecture enabled by the Global Information Grid.

Developers

SAIC	Charleston, South Carolina
Scientific Research Corporation	Charleston, South Carolina
Northrop Grumman (PRB Systems)	Hollywood, Maryland
L-3 Communications	Charleston, South Carolina
MANTECH	Charleston, South Carolina

UYQ-100 Undersea Warfare Decision Support System (USW-DSS)

Description

Undersea Warfare Decision Support System (USW-DSS) provides unique capabilities to shorten command and control (C2) decision processes from detection-to-engagement, extending unit level anti-submarine warfare (ASW) combat systems to a fully networked capability at the force and theater levels. USW-DSS is the sole Navy program of record providing an undersea warfare common tactical picture (CTP). USW-DSS complements and provides a two-way interface with common operational picture (COP) systems such as GCCS-M and Link-11/16. USW-DSS is maturing solutions that will coordinate all ASW sensors into a single, composite track picture capable of fire control. These decision support tools use a service-oriented architecture and communication links comprising sensor data from air, surface, submarine, theater, and surveillance platforms to provide rapid confidence in the decision processes between sensors and weapons. These capabilities provide the Sea Combat Commander (SCC), Theater ASW Commander (TASWC), and Anti-Submarine Warfare Commander (ASWC) an integrated capability to plan, conduct, and coordinate USW operations across all ASW platforms. USW-DSS will provide common and highly detailed visualization, integrated platform sensor and distributed combat systems, reduced data entry, improved sensor performance predictions, data fusion, while reducing redundancy of USW Tactical Decision Aids.

Status

USW-DSS has delivered a mix of two increments on a total of 35 surface combatants and aircraft carriers. USW-DSS is also operational at five shore commands and at five sites conducting initial and refresher training. These increments include Advanced Capability Build 2 (ACB-2) that provides unique USW mission-planning capabilities and mission execution, USW CTP, and Tactical Execution capabilities. ACB-2 is phasing out all prior increments as an early adopter for Consolidated Afloat Network and Enterprise Services (CANES) by installing as software only with Integrated Shipboard Network Services (ISNS) Increment I as well as software and hardware on forward-deployed naval forces. ACB-2 fielding will continue through FY 2015 on a total of 102 ships and shore sites. Design and task analysis for ACB-3 will commence following completion of ACB-2 operational evaluation in the first quarter FY 2013. ACB-3 will transition an Office of Naval Research project called Decision Support for Dynamic Target Engagement and take the next step in coordinating all ASW sensors for a single, composite track picture, capable of providing fire-control fidelity data.

Developers

Progeny Systems Corporation	Manassas, Virginia
Adaptive Methods Inc.	Centerville, Virginia
DDL Omni Engineering LLC	McLean, Virginia

OCEANOGRAPHY, SPACE, AND MARITIME DOMAIN AWARENESS

Littoral Battlespace Sensing–Unmanned Undersea Vehicles (LBS-UUV)

Description

The Littoral Battlespace Sensing–Unmanned Undersea Vehicle (LBS UUV) program of record provides a low-observable, continuous capability to characterize ocean properties that influence sound and light propagation for acoustic and optical weapon and sensor performance predictions within areas of interest. It will deliver buoyancy-driven undersea gliders (LBS-G) and autonomous self-propelled undersea vehicles (LBS-AUV) to enable anti-submarine, mine, expeditionary, and naval special warfare (ASW/MIW/EXW/NSW) planning and execution and persistent intelligence preparation of the environment (IPE). Launched and recovered from T-AGS oceanographic survey vessels, LBS-G and LBS-AUV will expand the survey capability of survey vessels in contested areas while increasing the spatial and temporal fidelity of the data collected to meet fleet and combatant commander (COCOM) requirements.

LBS-UUV is increment 1 of Littoral Battlespace Sensing, Fusion, and Integration (LBSF&I), the Department of the Navy's principal IPE programmatic construct for meteorological and oceanographic (METOC) data collection, processing, and data/product dissemination. LBS UUV is a key component of battlespace awareness through 2020 and beyond. LBSF&I is an integrated end-to-end system-of-systems capable of measuring a large variety of environmental parameters from the sea floor to the top of the atmosphere. LBSF&I will be capable of processing, exploiting, and assuring the quality of these data. The relevant information collected from this system is integrated at the Glider Operations Center into naval C4ISR systems as part of the Global Information Grid Enterprise Services (GIG-ES)/FORCENet infrastructure.

Status

LBS-G reached a favorable Full Rate Production decision in May 2011 and has commenced production of 35 gliders to be delivered by the end of FY 2012, with a total of 150 gliders to be delivered to the Naval Oceanographic Office by FY 2015.

LBS-AUV passed critical design review in March 2011 and has commenced production of two prototype systems. Milestone C and Low Rate Initial Production decision are anticipated in late FY 2012, with production and delivery of 12 AUVs anticipated between FY 2013 and FY 2017.

Developers

Teledyne Brown Engineering	Huntsville, Alabama
Teledyne Webb Research	East Falmouth, Massachusetts
Hydroid, Inc.	Pocasset, Massachusetts

Maritime Domain Awareness (MDA)

Description

The *National Plan to achieve Maritime Domain Awareness* defines maritime domain awareness as the "effective understanding of anything associated with the maritime domain that could impact the security, safety, economy, or environment of the United States." MDA facilitates timely decision-making that enables early actions to neutralize threats to U.S. national security interests. MDA results from the discovery, collection, sharing, fusion, analysis, and dissemination of mission-relevant data, information, and intelligence in the context of maritime political, social, economic, and environmental trends within geographic regions. No nation, let alone a single agency, can achieve MDA unilaterally. Effective MDA can be achieved only through the seamless collaboration across the entire maritime community at home and overseas. Therefore, key to improving MDA is a collaborative and comprehensive information and intelligence-sharing environment. The Navy MDA Concept signed in July 2011 emphasizes Navy Maritime Operations Centers (MOCs) as the focal point for efforts to improve Navy MDA, with analytical support provided by information and intelligence hubs via reach-back.

Status

An initial operational capability for MDA was achieved in August 2008. Subsequently, Navy completed a multi-phase capabilities-based assessment (CBA) that identified fleet MDA requirements to improve information access, analysis, and sharing to the wide range of partners.

On September 23, 2011, the U.S. Coast Guard issued an authority to operate the Dynamic Enterprise Integration Platform Enterprise Node (DEIP EN). DEIP EN is a SIPRNET web-based tool that provides MDA capabilities while addressing the CBA findings. In addition to replacing the existing MDA nodes located at Office of Naval Intelligence (ONI), Navy MOCs, and Coast Guard Maritime Intelligence Fusion Centers (MIFCs), DEIP EN allows Navy and Coast Guard analysts to have web-based access to the tools worldwide. Navy funding also supports MDA-focused analytical capability through the Naval Criminal Investigative Service (NCIS) and the Office of Naval Intelligence (ONI).

The Navy MDA Data Fusion and Analysis Functions of the Navy MDA Initial Capabilities Document (ICD) will guide future MDA tools development. These MDA tools will reside within Increment 2 of the Distributed Common Ground System-Navy (DCGS-N) program. Current MDA capabilities are in sustainment and will be maintained until DCGS-N Increment 2 capabilities are available in FY 2016.

Developers

Space and Naval Warfare Systems Command
(PMW-120) San Diego, California

Meteorological Mobile Facility Replacement Next Generation (METMF(R) NEXGEN)

Description

The Meteorological Mobile Facility Replacement Next Generation (METMF(R) NEXGEN) weather forecasting system provides meteorological and oceanographic (METOC) support to the U.S. Marine Corps and joint forces. The main functions of the system are to collect, process, exploit, interpret, produce, and disseminate METOC data. Following evolutionary acquisition, METMF(R) NEXGEN is a single-increment replacement of the Meteorological Mobile Facility Replacement (METMF(R)) that provides greater mobility and operational flexibility in response to identified METMF(R) capability gaps. The required capabilities for the METMF(R) are defined in two operational requirements documents.

Status

METMF(R) reached full operational capability in July 2002 and deployed in support of U.S. Marine Corps operational forces during *Operation Iraqi Freedom* and *Operation Enduring Freedom*, during which operational deficiencies were identified, and subsequently validated in several studies.

On May 31, 2006, the Marine Corps Combat Development Command (MCCDC) approved a universal need statement (UNS) for a "METOC Environmental Support System." The UNS identified a need for an expeditionary system with a smaller footprint than METMF(R), as well as upgraded sensing, fusing, and communications capabilities. The Program Executive Office Command, Control, Communications, Computers and Intelligence (PEO C4I)/ Program Manager, Warfare (PMW 120) performed an analysis of alternatives to analyze Marine Corps METOC capabilities and gaps, and determined the most effective course of action for best satisfying Marine Corps METOC requirements to be an upgraded or a next-generation METMF(R). Two METMF(R) NEXGEN prototypes have been developed, and the capability production document was approved in July 2010. METMF(R) NEXGEN passed its operational evaluation in September 2011, and was approved at Milestone C for full rate production in October 2011.

Developers

Smiths Detection — Edgewood, Maryland

Mobile User Objective System (MUOS)

Description

The Mobile User Objective System (MUOS) is the next-generation UHF satellite constellation. MUOS has a legacy UHF payload that provides the similar replacement capability to the legacy UHF constellation (ultra-high-frequency follow-on satellites), as well as a new MUOS wideband code division multiple access payload that will provide a significant improvement to spectrum usage efficiency required to meet growing warfighter needs. The MUOS constellation will consist of five geo-synchronous satellites, one of which will be an on-orbit spare. The MUOS design leverages

commercial technology, providing worldwide netted, point-to-point, and broadcast services of voice, video, and data. MUOS has been designated a DoD space major defense acquisition program. Target users are unified commands and joint task force components, DoD and non-DoD agencies, and allied and coalition mobile users who require communications on the move.

Status

Key Decision Point-C occurred in August 2006 and build approval was granted in February 2008. All five MUOS satellites are on contract and in production with the first satellite launch scheduled for February 2012.

Developers

Lockheed Martin	Sunnyvale, California
General Dynamics	Scottsdale, California
Boeing	El Segundo, Arizona

NAVSTAR Global Positioning System (GPS)

Description

The NAVSTAR GPS is a space-based, satellite radio navigation system that provides authorized users with 24/7, 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), the follow-on GPS Positioning, Navigation and Timing System (GPNTS) and anti-jam protection for high-priority combat platforms through the navigation warfare (NAVWAR) program. NAVWAR provides anti-jam antennas to protect air and sea naval platforms against GPS interference in order to ensure a continued high level of mission effectiveness in a GPS jamming environment. GPS plays an important role not only in precise navigation, but also in providing precise time to precision-strike weapons, naval surface fire support systems, and ship C4I systems. NAVSSI is the shipboard system that collects, processes, and disseminates position, velocity, and timing data to weapons systems, C4I, and combat-support systems on board surface warships. It hosts embedded card-based GPS receivers.

GPNTS will use next-generation GPS receivers, initially the Selective Availability Anti-Spoofing Module (SAASM), to be followed by M-Code capability, to ensure the U.S. Navy ships will be capable of using improved GPS signals being broadcast from the latest GPS satellites. GPNTS initial operating capability is expected in 2016.

Status

All Navy platform GPS installations are complete. The program has completed its development and integration of conformal anti-jam antennas into F/A-18E/F/G series *Hornet/Growler* aircraft. Development and operational testing and carrier suitability assessments were completed in March 2011. The Navy continues the installation of NAVSSIs on select Navy surface combatants, with an expected final operational capability (FOC) in FY 2015.

The GPNTS contract was awarded to Raytheon Integrated Defense Systems, San Diego, California by the Navy's Space and Naval Warfare (SPAWAR) Command on June 28, 2011. Preliminary Design Review (PDR) for G-PNTS is planned for late 2012.

Developers

Boeing Military Aircraft	St. Louis, Missouri
Litton Data Systems	San Diego, California
Raytheon	Los Angeles, California
Raytheon Integrated Defense Systems	San Diego, California
Rockwell-Collins	Cedar Rapids, Iowa
Trimble Navigation	Sunnyvale, California

T-AGS 66 Oceanographic Survey Ship

Description

The Pathfinder- class (T-AGS 60) oceanographic survey vessels comprise six 329-foot long, 5,000-ton vessels that provide multi-purpose oceanographic capabilities in coastal and deep-ocean areas. These ships perform acoustic, biological, physical, and geophysical surveys, and gather data that provide much of the military's information on the ocean environment as well as mapping the ocean floor to update nautical charts and promote safety of navigation. These data help to improve technology in undersea warfare and enemy ship detection. The ships are manned and operated for the Oceanographer of the Navy (OPNAV N2/N6E) by civilian crews provided by the Military Sealift Command (MSC). Mission scientists and technicians are from the Naval Oceanographic Office (NAVOCEANO). T-AGS 60-class ships are designed with a common bus diesel-electric propulsion system consisting of twin-screw propellers driven through Z-drives. The Z-drives, with 360-degree direction control, provide for precise position keeping and track-line following.

In FY 2013, the Navy will deliver the newest vessel to the fleet, USNS Maury (T-AGS 66), a modification of the T-AGS 60 Pathfinder class. Named after Matthew Fontaine Maury, the father of modern oceanography and naval meteorology, T-AGS 66 will be 24 feet longer than the in-service Pathfinder T-AGS vessels to accommodate the addition of an 18 x18-foot inboard moon pool. The moon pool will allow access to the water through the ship's hull for the deployment and retrieval of unmanned undersea vehicles. The increased ship length will also provide 12 additional permanent berthing accommodations. As on previous vessels, a hull-mounted mission system gondola will be used to house the multi-beam sonar system.

Status

The construction of USNS Maury (T-AGS 66) is under contract with VT Halter Marine of Pascagoula, Mississippi. The program is fully funded, and the keel was laid on February 1, 2011. Ship construction is currently underway, with an anticipated launch in summer 2012 and ultimate delivery to the Navy in the spring 2013.

Developers

Oceanographer of the Navy	Washington, District of Columbia
Naval Meteorology and Oceanography Command	Stennis Space Center, Mississippi
VT Halter Marine	Pascagoula, Mississippi

Task Force Climate Change (TFCC)

Description

The Navy's Chief of Naval Operations established Task Force Climate Change (TFCC) in 2009 to address the impacts of climate change on the Navy. TFCC consists of representatives from many Navy offices and staffs, the National Atmospheric and Oceanic Administration (NOAA), and the U.S. Coast Guard. The objective of TFCC is to develop policy, strategy, investment recommendations, and strategic communication regarding climate change and the Navy, with a near-term focus on the Arctic because that region is changing more rapidly than the rest of the world. TFCC addresses national, defense, and Navy strategic guidance in executing this objective.

Status

Task Force Climate Change has developed two roadmaps signed by the Vice Chief of Naval Operations, which provide plans of action with timelines to drive Navy policy, engagement, and investment decisions regarding the Arctic and global climate change. Actions specified in the roadmaps are underway and Task Force Climate Change provides quarterly updates to the Chief of Naval Operations. In these roadmaps, a near-term priority is improving the Navy's understanding of the changing Arctic environment. Following the guidance in the 2010 Quadrennial Defense Review, the Navy's initial investment strategy for the Arctic involves science and technology efforts to improve the capability to observe and predict the physical changes in high-latitude maritime regions.

Developers

None.

SECTION 6
SUPPLY AND LOGISTICS

Naval logistics is essential to our combat power, bridging our nation's industrial base to forward deployed naval forces. Readiness and the ability to sustain operations hinge upon logistics support. Naval logistics is the process of getting material from the manufacturer's shipping terminal to our forces worldwide. In addition to material, naval logistics encompasses planning, acquisition, maintenance, engineering support, training, transportation, facilities operations, and personnel support backing up our naval forces around the globe, day and night, in peace and war.

Joint High-Speed Vessel (JHSV)

Description

JHSV is a high-speed, shallow-draft surface vessel able to transport rapidly medium payloads of cargo and personnel over intra-theater distances and load/offload without reliance on port infrastructure. During advanced concept technology demonstration testing, leased high-speed vessels such as Joint Venture (HSV X1), Swift (HSV 2), and Westpac Express (HSV 4676) have demonstrated the ability to embark and transport combat forces rapidly. JHSV is an intra-theater lift capability, not an assault platform. JHSV will be capable of speeds in excess of 35 knots and ranges of 1,200 nautical miles fully loaded. In addition, the shallow-draft characteristics will enable the JHSV to operate effectively in littoral areas and access small, austere ports.

Status

Initially, the JHSV program was envisioned to have five of the first ten JHSVs assigned to the Army and five to the Navy. However, at the Army/Navy Warfighter Talks in December 2010, both services agreed to transfer to the Navy the Army's five JHSVs upon signing of a Memorandum of Agreement (MOA). When the MOA was signed by the Service Secretaries on May 2, 2011, the Department of the Army transferred program responsibility and the funding required for the five Army JHSVs to the Navy. Spearhead (JHSV 1) was launched and christened in September 2011 and will deliver in the second quarter 2012.

Developers

AUSTAL USA — Mobile, Alabama

Naval Tactical Command Support System (NTCSS)

Description

Naval Tactical Command Support System (NTCSS) is the combat logistics support information system used by Navy and Marine Corps commanders to manage and assess unit and group material and personnel readiness. As the logistics management cornerstone of the Sea Basing pillar of Sea Power 21, NTCSS provides intermediate and organizational maintenance, supply, and personnel administration management capabilities to surface, sub-surface, and aviation operational commanders in peacetime and during war. NTCSS also supports network-centric warfare by integrating logistics information to complement the tactical readiness picture for operational commanders.

Through an evolutionary acquisition strategy, NTCSS replaced, merged, and optimized 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 and modernized capability. The first stage of the strategy included hardware modernization and network installations using open system architectures and operating

environments common with shipboard tactical programs. The second stage optimized the functional applications using modern software development tools, relational databases, and data replication.

Going forward, business process improvements are being developed and implemented under sponsorship of functional and fleet managers. Such planned initiatives include: migration to an open service oriented architecture (SOA), data center hosting, implementation of web services, transfer of shipboard logistics data ashore as part of a broader initiative to Move Workload Ashore and reduce shipboard manpower, making NTCSS data accessible via the common operational picture to enable operational decisions based on near-real-time readiness data, and merging systems such as NTCSS, GCSS-MC, and GCSS-M into a common/shared capability that exchanges data with Naval Enterprise Resource Planning (ERP). As a result, the Navy and Marine Corps will realize greater operational efficiency and lower total ownership costs.

Status

NTCSS is a mature program in Full Rate Production and continues to be the warfighter's production system to maintain Fleet readiness. Full Operational Capability (FOC) at naval air stations, Marine air logistics squadrons, and ship and submarines was achieved in FY 2010. An optimized NTCSS capability, targeted for aircraft squadrons, began Full Rate Production in FY 2007 and will achieve FOC in the first quarter FY 2012. The "tech refresh" to replace antiquated NTCSS hardware/software and maintain compliance with DoD/DoN Information Assurance and Baseline Reduction mandates commenced in FY 2010, with the completion of deployment cycle planned in FY 2015.

Developers

CACI	Norfolk, Virginia
Advanced Enterprise Systems (AES)	Norfolk, Virginia

Navy Enterprise Resource Planning (Navy ERP)

Description

Enterprise Resource Planning (ERP) is a generic name for comprehensive management systems used to power an organization's crucial business functions. The Navy ERP solution allows the Navy to unify, standardize, and streamline all its business activities into one system that will deliver information transparency that is secure, reliable, accessible, and current. The solution enables sustained Navy compliance with the Chief Financial Officers Act of 1990 and the DoD Information Assurance Certification and Accreditation Process. Navy ERP is being delivered in two releases. Finance/Acquisition Solution (Release 1.0) provides the Navy with unprecedented financial transparency that can be leveraged across the Navy as a common cost-management framework. This release provides the Navy with an enterprise solution supporting budgeting, billing, external procurement, period close, business warehousing, and cost planning. The Single Supply Solution (Re-

lease 1.1) delivers enterprise visibility and process standardization of the Navy Supply Chain. The Single Supply Solution provides an integrated capability from global planning to local inventory handling enabling the Navy to optimize positioning of stock to improve fleet readiness and maximize use of supply funds and assets. More specifically, the Single Supply Solution supports such functions as order fulfillment, inventory management, consignment, warehouse management, provisioning, carcass tracking, supply outfitting, and supply and demand planning. Navy ERP combines business process reengineering (BPR) and industry best practices, supported by commercial off-the-shelf software (SAP), and integrates all facets of Navy business operations, using a single database to manage shared common data.

Status

Navy ERP financial solution has been deployed to the following commands: NAVAIR (2007), NAVSUP (2008), SPAWAR (2009), NAVSEA General Fund (2010), and NAVSEA Working Capital Fund (2011). Remaining deployments are to the office of Naval Research (ONR) and Strategic Systems Programs (SSP) in 2012. The Navy ERP Single Supply Solution deployment started in February 2010, and has been successfully deployed to the Naval Inventory Control Points at Philadelphia and Mechanicsburg. The first Regional implementation of the Single Supply Solution was completed in July 2012 and the two remaining Regional implementations will be completed in March and August 2012. Initial Operating Capability (IOC) was achieved in May 2008. In October 2008, the Assistant Secretary of the Navy (Financial Management and Comptroller) designated Navy ERP the Navy's Financial System of Record. Navy ERP currently has 66,000 users and at Full Deployment will have approximately 71,000 users, and will manage approximately 50% of the Navy's Total Obligation Authority (TOA).

Developers

SAP America, Inc.	Newtown Square, Pennsylvania
IBM	Armonk, New York
Deloitte Consulting	Alexandria, Virginia
GDIT	Fairfax, Virginia

T-AH 19 Mercy-Class Hospital Ship

Description

The two T-AH 19 Mercy-class hospital ships are national strategic assets and are employed in support of combatant commander (COCOM) requirements. Hospital ships provide a highly capable medical facility and are configured and equipped to meet their primary mission as a large-scale trauma center for combat operations. Each ship has 12 operating rooms and up to 1,000 beds (100 acute care, 400 intermediate, and 500 minor). Additionally, the hospital ships serve as cornerstones for peacetime shaping and stability operations, acting as powerful enablers of stability, security, and reconstruction efforts around the globe. Hospital ships provide a highly visible, engaged, and reassuring presence when deployed for theater security cooperation (TSC) or when called to respond to humanitarian assistance or disaster relief (HA/DR) missions.

As part of the Naval Fleet Auxiliary Force (NFAF) under control of the Military Sealift Command (MSC), these ships are maintained in either a reduced operating status (ROS) or full operating status depending on mission tasking and COCOM requests. Generally, one hospital ship is scheduled for a 120-150 day TSC deployment per year. Periodic maintenance is performed to ensure both ships are able to meet full operational capability within a few days of activation when they are in ROS status. These ships are manned by a civilian mariner crew with medical staff augmentation during periods of activation.

Status
The two hospital ships—USNS Mercy and USNS Comfort (T-AH-20)—have an expected service lives to 2020 and 2021, respectively. In 2012, various options for future afloat medical support will be evaluated.

Developers
None.

T-AKE 1 Lewis and Clark-Class Dry Cargo and Ammunition Ship

Description
The Lewis and Clark (T-AKE 1)-class dry cargo and ammunition ships replace the Kilauea (T-AE 26), Mars (T-AFS 1), and Sirius (T-AFS 8) classes of fleet auxiliaries. T-AKE ships provide logistic lift from sources of supply and transfer this cargo at sea to customer ships or to station ships that are directly supporting combat forces and other naval vessels. As a secondary mission, T-AKEs can act in concert with a fleet oiler (T-AO) as a substitute station ship. T-AKE ships are built to commercial standards and crewed by Military Sealift Command civilian mariners with small military detachments (MILDETs). That said, the crews will be 100 percent civilian mariners by 2013. A Navy aviation detachment or commercial equivalent using contracted commercial helicopters provides vertical replenishment capability.

Status
The fixed price incentive contract with General Dynamics National Steel and Shipbuilding Company (NASSCO) included option pricing for up to 14 T-AKE hulls to support Combat Logistics Force (CLF) and Maritime Prepositioning Force (MPF) program requirements. The Navy and the Marines have agreed that hulls 12-14 that were originally designated for the MPF will instead serve as CLF ships, and the MPF will receive the first two hulls in the class. The third ship that was to be assigned to MPF will be designated as a CLF asset and be placed in a reduced operating status (ROS)-5, maintained pierside with a reduced crew and will support surge operations within five days of notification.

Developers
National Steel and Shipbuilding Company San Diego, California

T-AO(X) Replenishment Oiler

Description

In early 2012, the Navy has 15 in-service Kaiser (T-AO 187)-class replenishment oilers in the Combat Logistics Force. The ships are part of the Naval Fleet Auxiliary Force (NFAF) under the control of the Military Sealift Command (MSC) and are crewed by MSC civilian mariners. The ships shuttle dry/cargo and fuel from resupply bases or station ships to Navy combatants and task forces in the areas of operation. They provide bulk petroleum (e.g., DFM and JP5) and stores, packaged cargo, refrigerated cargo, and mail to forces afloat. The Kaiser-class oilers start to reach the end of their 35-year estimated service lives beginning in 2021. Of the 15 Kaiser-class oilers in service, only three have been constructed to meet International marine pollution regulations with double hulls.

Status

The Capabilities Based Assessment for the T-AO(X) was completed in March 2010. The Initial Capabilities Document was approved by the Joint Requirements Oversight Council in January 2011. The Material Development Decision Acquisition Decision Memorandum of March 2011 approved entry into the Materiel Solution Analysis Phase and initiation of the Analysis of Alternatives (AoA). The AoA commenced in March 2011 and completed in October 2011, and the program was given permission to develop the Capability Development Document. The lead ship is funded for production in 2016.

Developers

To be determined.

T-ATF(X) Fleet Ocean Tugs

Description

In early 2012, the Navy has four in-service T-ATF fleet ocean tugs to support towing, diving, and rescue operations. The primary missions of the T-ATF include emergency towing of battle-damaged ships, providing fire fighting assistance to other ships, and supporting submarine-rescue and portable self-sustaining deep-diving operations.

Two of the four T-ATFs will reach their estimated service lives (ESL) in 2020 and the remaining two in 2021. These retirements are within five years of when the Navy's four T-ARS rescue and salvage ships reach the end of their ESLs. Recapitalization of the T-ATF and T-ARS classes is required, either in kind, or with a common hull as a Towing, Salvage and Rescue Ship (T-ATS(X)). The Analysis of Alternatives (AoA) will determine whether using a common hull for both classes would accrue meaningful cost savings and meet both ships' operational requirements.

Status

The Initial Capabilities Document was approved in December 2010. The Material Development Decision Acquisition Decision Memorandum of February 2011 approved entry into the Materiel Solution Analysis Phase and initiation of the AoA. The AoA commenced in May 2011 and will be completed in early 2012. The AoA results will be briefed at the Gate 2 review schedule for March 2012 to gain Navy leadership approval to move forward with the Capabilities Development Document (CDD). Milestone A will be scheduled following approval of the CDD. Lead ship is funded in 2016.

Developers

To be determined.

APPENDIX A
NAVY-MARINE CORPS CRISIS RESPONSE AND COMBAT ACTIONS

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 Military Sealift Command 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
July 2000	Wildfires in U.S. West Assistance to firefighters	3d Battalion, 11th Marines, I MEF*
Aug 2000	Bahrain Gulf Air Airbus 320 Crash Search 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 Marine Expeditionary Unit (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

Dates	Location/Operation/Mission	U.S. Naval Forces
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 Units USS John C. Stennis (CVN 74) CVBG 6 Cyclone-class PCs Aegis cruisers and destroyers
Oct 2001 - Ongoing	Afghanistan and other counterterrorism operation sites around the globe Operation Enduring Freedom Strike and combat operations against terrorist forces Coastal patrol and maritime homeland security	USS Enterprise (CVN 65) Battle Group 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 Nimitz (CVN 68) USS Mount Whitney (LCC 20) USS George Washington (CVN 73) Battle Group USS Nassau (LHA 4) ARG USS Essex (LHD 2) ARG USS O'Kane (DDG 77) USS Chafee (DDG 90) USS Mount Whitney (LCC 20) USS Dwight D. Eisenhower (CVN 69) Carrier Strike Group USS Chosin (CG 65) USS Ingraham (FFG 61) USS Boxer (LHD 4) Expeditionary Strike Group 15th Marine Expeditionary Unit USS Oak Hill (LSD 51) USS Roosevelt (DDG 80) USS Vicksburg (CG 69) USS Trenton (LPD 14) USS Hue City (CG 66) USS James E. Williams (DDG 95) USS Saipan (LHA 2) USS Taylor (FFG 50) USS Ashland (LSD 48) USS Nassau (LHA 4) Expeditionary Strike Group 22nd Marine Expeditionary Unit USS Ronald Reagan (CVN 76) Carrier Strike Group USS Gonzalez (DDG 66) USS Peleliu (LHA 5) Expeditionary Strike Group 11th Marine Expeditionary Unit USS Iwo Jima (LHD 7) Expeditionary Strike Group 24th Marine Expeditionary Unit USS Wasp (LHD 1) Expeditionary Strike Group USS Ardent (MCM 12) USS Dextrous (MCM 13)

Dates	Location/Operation/Mission	U.S. Naval Forces
		USS Cardinal (MHC 60) USS Chinook (PC 9) USS Typhoon (PC 5) USS Whirlwind (PC 11) USS Raven (MHC 61) USS Sirocco (PC 6) USS Firebolt (PC 10)
Oct 2001 - Ongoing	Mediterranean Operation Active Endeavour NATO response to 9/11 Monitoring Shipping / Intelligence Exchange	USS Elrod (FFG 55) USS Hawes (FFG 53) USS Underwood (FFG 36) USS Mahan (DDG 72) USS Doyle (FFG 39) USS Dewert (FFG 45) Elements of U.S. 6th Fleet USS Arleigh Burke (DDG 51) USS Simpson (FFG 56) USS Elrod (FFG 55) USS Boone (FFG 28) USS Ross (DDG 71) USS Monterey (CG 61) USS Carr (FFG 52) USS Porter (DDG 78)
Jan - Apr 2002	Strait of Malacca Ship protection	USS Ford (FFG 54) USS Cowpens (CG 63)
Feb - May 2002	El Salvador	NMCB-7
Feb - July 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 SEAL Forces Marine Helicopters
June 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	Commander, Carrier Strike Group SIX USS Mount Whitney (LCC 20) 24th Marine Expeditionary Unit (SOC)* USS Iwo Jima (LHD 7) ARG USS Peleliu (LHA 5) ESG USS Belleau Wood (LHA 3) ARG USS Nassau (LHA 4) ARG Naval Mobile Construction Battalions Naval Special Warfare units Navy Medical Forces

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 George Washington (CVN 73) Carrier Strike Group USS Nimitz (CVN 68) Carrier Strike Group USS John F. Kennedy (CV 67) 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 Wasp (LHD 1) Expeditionary Strike Group USS Essex (LHD 2) Expeditionary Strike Group USS Iwo Jima (LHD 7) Expeditionary Strike Group USS Belleau Wood (LHA 3) 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 (LHA 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) HSVX-1 Joint Venture USNS Comfort (T-AH 20) 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 units Naval Mobile Construction Battalions Navy Special Warfare units Navy Medical Forces 1st Marine Expeditionary Force 2nd Marine Expeditionary Brigade 15th Marine Expeditionary Unit 31st Marine Expeditionary Unit USS Mount Whitney (LCC-20) USCG Cutters Fleet Hospital (FH) Dallas USS Dwight D. Eisenhower (CVN 69) Carrier Strike Group USS Ardent (MCM 12)

Dates	Location/Operation/Mission	U.S. Naval Forces
		USS Dextrous (MCM 13) USS Cardinal (MHC 60) USS Chinook (PC 9) USS Typhoon (PC 5) USS Whirlwind (PC 11) USS Raven (MHC 61) USS Sirocco (PC 6) USS Firebolt (PC 10) USS Oak Hill (LSD 51) USS Roosevelt (DDG 80) USS Vicksburg (CG 69) USS Trenton (LPD 14) USS Hue City (CG 66) USS James E. Williams (DDG 95) USS Taylor (FFG 50) USS Ashland (LSD 48) 13th Marine Expeditionary Unit (MEU) 22nd Marine Expeditionary Unit (MEU) USS Ronald Reagan (CVN 76) Carrier Strike Group USS Gonzalez (DDG 66) USS Peleliu (LHA 5) Expeditionary Strike Group 11th Marine Expeditionary Unit (MEU) 24th Marine Expeditionary Unit (MEU) USS John C. Stennis (CVN 74) Carrier Strike Group USS Bataan (LHD 5) Expeditionary Strike Group USS Bonhomme Richard (LHD 6) Expeditionary Strike Group
July 2003	Liberia	Fleet Antiterrorism Security Team (FAST) Security of American, Allied Citizens
Dec 2004	Humanitarian Assistance and Disaster Relief to Philippines	Joint Task Force 535
Dec 2004 - Mar 2005	Operation Unified Assistance	USS Abraham Lincoln Carrier Strike Group USS Fort McHenry (LSD 43) USS Essex (LHD 2) USS Bonhomme Richard (LHD 6) Expeditionary Strike Group USS Hue City (CG 66) Combined Support Force 536 USNS Mercy (T-AH 19) USNS Tippecanoe (T-AO 199) 15th Marine Expeditionary Unit USMC 9th Engineer Support Battalion Naval Mobile Construction Battalion 7 Environmental/Preventive Medicine Unit 6 USCG personnel Joint POW/MIA forensic team
Aug - Oct 2005	U.S. Gulf Coast Hurricane Relief Effort	USS Harry S. Truman (CVN 75) USS Bataan (LHD 5) USS Iwo Jima (LHD 7) USS Shreveport (LPD 17) USS Tortuga (LSD 46) USS Whidbey Island (LSD 41) USS Grapple (ARS 53) USNS Comfort (T-AH 20) USNS Arctic (T-AOE 8)

Dates	Location/Operation/Mission	U.S. Naval Forces
		Naval Mobile Construction Battalion 40 2nd MEF* Helicopter Sea Combat Squadron 28 22nd Seabee* Readiness Group Beach Master Unit 2 Assault Craft Unit 2 Mobile Diving and Salvage Unit 2 Helicopter Anti-Submarine Squadron Light 43
Oct 2005 - Mar 2006	Pakistan Earthquake Relief Effort	USS Tarawa (LHA 1) USS Pearl Harbor (LSD 52) USS Cleveland (LPD 7) USS Chosin (CG 65) Combined Joint Task Force 76 Commander, Task Force 53 Helicopter Sea Combat Squadron 26 Naval Mobile Construction Battalion 3 Naval Mobile Construction Battalion 4 Naval Mobile Construction Battalion 74 Helicopter Mine Countermeasures 15 Fleet Logistics Support Squadron (VR) 56
Jan 2006 - Ongoing	Extended Maritime Interdiction Operations	USS Pinckney (DDG 91) USS Chung-Hoon (DDG 93) USS Momsen (DDG 92) USS Halsey (DDG 97) USS Rentz (FFG 46)
Jan 2006 - Ongoing	Maritime Counter Terrorism Support to Operation Enduring Freedom – Philippines Support to Joint Special Operations Task Force – Philippines	Combined Joint Task Force 515 Commander, Task Force 75 USNS GySgt Fred W. Stockham (T-AK 3017) HSV 2 Swift USS Rentz (FFG 46) USS Chung Hoon (DDG 93) USS Halsey (DDG 97) USS Pinckney (DDG 91) USS Momsen (DDG 92) USS Lassen (DDG 82) USS Juneau (LPD 10) Helicopter Anti-Submarine Squadron 10 Helicopter Anti-Submarine Squadron Light 37 Helicopter Anti-Submarine Squadron Light 43 Mobile Security Squadron 7
Feb - Mar 2006	Leyte Island Mudslide Relief Effort	Commander, Task Force 76 USS Essex (LHD 2) USS Harpers Ferry (LSD 49) USS Curtis Wilbur (DDG 54) 31st Marine Expeditionary Unit
Feb - Aug 2006	PACOM Presence/RIMPAC	USS Abraham Lincoln (CVN 72) USS Mobile Bay (CG 53) USS Russell (DDG 59) USS Shoup (DDG 86) Carrier Strike Group 9 COMDESRON 9 Helicopter Anti-Submarine Squadron Light 47 Explosive Ordnance Disposal Mobile Unit 11 Det 1

Dates	Location/Operation/Mission	U.S. Naval Forces
Apr - May 2006	Partnership of the Americas	USS George Washington (CVN 73) Carrier Air Wing 17 USS Monterey (CG 61) USS Stout (DDG 55) USS Underwood (FFG 36)
May - Jul 2006	Limited Defense Operations Taepo Dong 2	COMSEVENTHFLT USS Curtis Wilbur (DDG 54) USS Fitzgerald (DDG 62) USS John S McCain (DDG 56) USS Russell (DDG 59)
May - Sep 2006	USNS Mercy Medical Civil Action Program	Commander, Task Force 10 Commander, Task Group 10.1 Commander, Task Group 10.2 Commander, Task Unit 10.1.1 Commander, Task Unit 10.2.1 COMPHIBRON 7 USNS Mercy (T-AH 19) USNS Niagra Falls (T-AFS 3) Medical Treatment Facility MERCY Helicopter Sea Combat Squadron 25 Naval Mobile Construction Battalion 40 Mobile Security Squadron 7 Fleet Logistics Support Squadron 51
Jul - Sep 2006	Joint Task Force Lebanon Operation Strengthen Hope	USS Iwo Jima (LHD 7) USS Wasp (LHD 1) USS Nashville (LPD 13) USS Trenton (LPD 14) USS Whidbey Island (LSD 41) USS Hue City (CG 66) USS Barry (DDG 52) USS Gonzalez (DDG 66) USS Mount Whitney (LCC/JCC 20) HSV Swift (HSV 2) 24th Marine Expeditionary Unit
Mar - Sep 2007	Partnership of the Americas	USS Pearl Harbor (LSD 52) DESRON 40 USS Mitscher (DDG 57) USS Samuel B. Roberts (FFG 58)
May - Sep 2007	Pacific Partnership	USS Peleliu (LHA 5) Naval Mobile Construction Battalion 7/ACB 1
Jun 2007	West African Training Cruise (WATC)	Underwater Construction Team
Jun - Oct 2007	Humanitarian Assistance Deployment	USNS Comfort (T-AH 20) COMDESRON 24 Helicopter Sea Combat Squadron 28 DET 2 Mobile Security Detachment 26 Combat Camera Naval Mobile Construction Battalion 133 Interpreter

Dates	Location/Operation/Mission	U.S. Naval Forces
		USFF Band Oceano Team Medical Staff Augmentation Fleet Public Affairs
Jun - Oct 2007	Global Fleet Station	HSV Swift (HSV 2)
Aug 2007	Minneapolis Bridge Collapse	Mobile Diving and Salvage Unit 2 Combat Camera Underwater Construction Team 1
Aug 2007	Hurricane Dean	SEPLOs REPLOs Combat Camera
Sep 2007	Hurricane Felix	USS Wasp (LHD 1) USS Samuel B. Roberts (FFG 58) NEPLO
Oct - Nov 2007	SOCAL Wild Fire Fighting	Combat Camera P-3 W/ Full Mission Video Tactical Common Data Link Det Helicopter Sea Combat Squadron 85 HH-60 Det ACB 1 NEPLOs Fire Trucks W/Fire Fighting Personnel
Nov 2007	Tropical Storm Noel	NEPLOs
Nov 2007	Tropical Cyclone Bangladesh	USS Kearsarge (LHD 3) 22nd Marine Expeditionary Unit (SOC)* USS Essex (LHD 2) USS Tarawa (LHA 1)
Nov 2007 - Feb 08	Africa Partnership Station	USS Fort McHenry (LSD 43) Naval Mobile Construction Battalion 40 USS Annapolis (SSN 760) HSV Swift (HSV 2)
Nov 2007 - Dec 2008	Anti Piracy Operations in the Horn of Africa	Numerous ships assigned to Commander, Task Force 150
Nov 2007- Nov 2008	Development and Reconstruction of Afghanistan	Carrier Airwing 8 USS Theodore Roosevelt (CVN 71) Individual Augmentees / GWOT Support Assignments
Feb 2008	Southern Partnership Station	HSV Swift (HSV 2)
Feb 2008	Rogue Satellite Shoot Down	USS Lake Erie (CG 70)
Apr - Jun 2008	Continuing Promise 2008 Humanitarian Civic Assistance (HCA) U.S. Southern Command (SOUTHCOM)	USS Boxer (LHD 4) COMPHIBRON 5 Fleet Surgical Team 5 U.S. Public Health Service Navy SEABEE Construction Battalion Maintenance Unit 303 Helicopter Mine Countermeasures Squadron 14

Dates	Location/Operation/Mission	U.S. Naval Forces
		Marine Medium Helicopter Squadron 764 Tactical Air Control Squadron 11 Special Marine Air Ground Task Force 24 Helicopter Sea Combat Squadron 23 Assault Craft Unit 1 Fleet Survey Team Maritime Civil Affairs Team 205 Beach Master Unit 1 Fleet Public Affairs
Apr - Oct 2008	Partnership of the Americas 2008 U.S. Southern Command (SOUTHCOM)	USS George Washington (CVN 73) COMDESRON 40 USS Farragut (DDG 99) USS Forrest Sherman (DDG 98) USS Kauffman (FFG 59)
May - June 2008	Pacific Partnership	USNS Mercy (T-AH 19) USS Peleliu (LHA 5)
June, Oct - Nov 2008	Southern California Wildfires	Navy Emergency Preparedness Liaison Officers Helicopter Sea Combat Squadron 85 (HSC-85)
Jun - Sep 2008	Navy Dive Southern Partnership Station 2008 Multinational Maritime Partnership U.S. Southern Command (SOUTHCOM)	USNS Grasp (T-ARS 51)
Aug - Nov 2008	Continuing Promise 2008 Humanitarian Civic Assistance (HCA) U.S. Southern Command (SOUTHCOM)	USS Kearsarge (LHD 3) COMPHIBRON 8 Fleet Surgical Team 4 U.S. Public Health Service Navy SEABEE Construction Battalion Maintenance Unit 202 Air Force Civil Engineering Squadron 5 Navy Assault Craft Unit 2 Naval Beach Group 2 Maritime Civil Affairs Squadron 2 Helicopter Sea Combat Squadron 28 Marine Heavy Helicopter Squadron 464 Fleet Public Affairs
Aug 2008	Russia / Georgia Conflict – Humanitarian Assistance	USS Mount Whitney (LCC 20) USS McFaul (DDG 74)
Aug 2008	Hurricane Gustav Recovery Operations	Naval Facilities Engineering Command Fleet & Family Support Center
Sep 2008	Haiti Disaster Relief (DR) U.S. Southern Command (SOUTHCOM)	USS Kearsarge (LHD 3) COMPHIBRON 8 Fleet Surgical Team 4 U.S. Public Health Service Navy SEABEE Construction Battalion Maintenance Unit 202 Air Force Civil Engineering Squadron 5 Navy Assault Craft Unit 2 Naval Beach Group 2 Maritime Civil Affairs Squadron 2 Helicopter Sea Combat Squadron 28 Marine Heavy Helicopter Squadron 464 Fleet Public Affairs

Dates	Location/Operation/Mission	U.S. Naval Forces
Sep - Oct 2008	Air Force B-52 Salvage & Recovery Ops Guam	USNS Sioux (T-ATF 171)
Oct 2008 - Apr 2009	Counter Illicit Trafficking (CIT) OPS U.S. Southern Command (SOUTHCOM)	USS Samuel B. Roberts (FFG 58) USS Underwood (FFG 36) USS Rodney M. Davis (FFG 60)
Nov 2008 - Apr 2009	Southern Partnership Station 2008/2009 Multinational Maritime Partnership U.S. Southern Command (SOUTHCOM)	HSV Swift (HSV 2)
Dec 2008 - Feb 2009	Counter Illicit Trafficking (CIT) OPS U.S. Southern Command (SOUTHCOM)	USNS Saturn (T-AFS 10)
Dec 2008 - Ongoing	Operation Iraqi Freedom CTF-IM	USS Nitze (DDG 94) USS Lake Champlain (CG 57) USS Halyburton (FFG 40) USS Paul Hamilton (DDG 60) USS John Paul Jones (DDG 53) USS Milius (DDG 69) USS Decatur (DDG 73) USS Port Royal (CG 73) USS Hopper (DDG 70) USS Benfold (DDG 65) USS Chinook (PC 9) USS Typhoon (PC 5) USS Whirlwind (PC 11) USS Sirocco (PC 6) USS Firebolt (PC 10)
Dec 2008	WESTPAC / MCPI / UNSCR Operation Enduring Freedom - Afghanistan (Struggle Against Violent Extremism) (Maritime Security Operations) (Partnership, Strength & Presence)	USS The Sullivans (DDG 68) USS Dwight D Eisenhower (CVN-69) Carrier Strike Group USS Ronald Reagan (CVN-76) Carrier Strike Group USS Nimitz (CVN-68) Carrier Strike Group USS Iwo Jima (LHD-7) Expeditionary Strike Group USS Bataan (LHD-5) Expeditionary Strike Group USS Boxer (LHD-4) Expeditionary Strike Group USS Bonhomme Richard (LHD-6) Expeditionary Strike Group 13th Marine Expeditionary Unit (MEU) 22nd Marine Expeditionary Unit (MEU) 11th Marine Expeditionary Unit (MEU) USS San Antonio (LPD 17) USS Carter Hall (LSD 50) USS New Orleans (LPD 18) USS Lake Champlain (CG 57) USS Chung-Hoon (DDG 93) USS Comstock (LSD 45) USS Bataan (LHD 5) USS Ponce (LPD 15) USS Fort McHenry (LSD 43) USS Cleveland (LPD 7)

Dates	Location/Operation/Mission	U.S. Naval Forces
		USS Rushmore (LSD 47) USS Ramage (DDG 61) USS Monterey (CG 61) USS Mason (DDG 87) USS Nitze (DDG 94) USS Mahan (DDG 72) USS Milius (DDG 69) USS Gettysburg (CG 64) USS Vicksburg (CG 69) USS Vella Gulf (CG 72) USS Chancellorsville (CG 62) USS Howard (DDG 83) USS Rentz (FFG 46) USS Ingraham (FFG 61) USS DeWert (FFG 45) USS Hopper (DDG 70) USS Benfold (DDG 65) USS Ardent (MCM 12) USS Dextrous (MCM 13) USS Gladiator (MCM 11) USS Scout (MCM 8) USS Sampson (DDG 102) USS Gridley (DDG 101) USS James E Williams (DDG 95) USS Thach (FFG 43) USS Decatur (DDG 73) USS Paul Hamilton (DDG 60) USS John Paul Jones (DDG 53) USS Porter (DDG 78) USS Bainbridge (DDG 96) USS Chosin (CG 65) USS Pinckney (DDG 91)
Jan - Dec 2009	Counter-Piracy Operations in the GOA (Gulf of Aden) / HOA (Horn of Africa) Somali Basin / Arabian Sea	Numerous U.S. and Combined Maritime Force ships assigned to CTF-151 USS The Sullivans (DDG 68) USS Lake Champlain (CG 57) USS Chung-Hoon (DDG 93) USS Vicksburg (CG 69) USS James E Williams (DDG 95) USS Thatch (FFG 43) USS Anzio (CG 60) USS Bainbridge (DDG 96) USS Rentz (FFG 46) USS Ingraham (FFG 61) USS Winston S Churchill (DDG 81)
Jan - Dec 2009	Standing NATO Maritime Group (SNMG)	USS Halyburton (FFG 40) USS Donald Cook (DDG 75) USS Stephen W Groves (FFG 29)
15 Feb 2009- 05 Apr 2009	WESTPAC / DYNAMIC SPRING/LDO	COMPACFLT COMSEVENTHFLT CTF 70 DESRON 15 USS Shiloh (CG 67) USS Cowpens (CG 63)

Dates	Location/Operation/Mission	U.S. Naval Forces
		USS Hopper (DDG 70) USS John S McCain (DDG 56) USS Curtis Wilbur (DDG 54) USS Fitzgerald (DDG 62) USS Stethem (DDG 63)
Apr 2009	Maersk Alabama Piracy/ Rescue	USS Bainbridge (DDG 96) USS Halyburton (FFG 40) USS Boxer (LHD 4)
	Summit of the Americas Support Caribbean	USS Winston S. Churchill (DDG 81) USS Hawes (FFG 53) COMDESRON 26
Apr - Jul 2009	Continuing Promise 2010 Humanitarian Civic Assistance (HCA) U.S. Southern Command (SOUTHCOM)	USNS Comfort (T-AH 20) COMPHIBRON 6 Fleet Surgical Team 4 U.S. Public Health Service Helicopter Sea Combat Squadron 26 Navy SEABEE Construction Maintenance Battalion Unit 202 Maritime Civil Affairs Squadron 2 U.S. Air Force Band Fleet Public Affairs
Apr - May 2009	Unitas Gold 2009 U.S. Southern Command (SOUTHCOM)	COMDESRON 40 USS Mesa Verde (LPD 19) USS Doyle (FFG 39) USS Kauffman (FFG 59) USS Donald Cook (DDG 75) USS Oscar Austin (DDG 79) USS Ashland (LSD 48) USS Winston S. Churchill (DDG 81) USS San Jacinto (CG 56) USS Forrest Sherman (DDG 98) USS John L. Hall (FFG 32)
Apr - Oct 2009	Southern Seas 2009 U.S. Southern Command (SOUTHCOM)	COMDESRON 40 USS Doyle (FFG 39) USS Kauffman (FFG 59) USS Ford (FFG 54)
	Counter Illicit Trafficking (CIT) OPS U.S. Southern Command (SOUTHCOM)	USS Gary (FFG 51) USS Carr (FFG 52) USS Hawes (FFG 53) USS Simpson (FFG 56) USS Newport News (SSN 750)
May - Oct 2009	Counter Illicit Trafficking (CIT) OPS U.S. Southern Command (SOUTHCOM)	USS Jarrett (FFG 33) USNS Robert E. Peary (T-AKE 5)
May - 30 Sep 2009	WESTPAC / Pacific Partnership 2009 / FHA & TCP	USNS Richard E Byrd, CDS 21
17 Jun- 07 July 2009	WESTPAC / MCPI / UNSCR	CTF 72 DET USS McCampbell (DDG 85)
Jun - Jul 2009	Air France Flight #447 Recovery OPS South Atlantic	Supervisor of Salvage and Diving (SUPSALV) NAVOCEANO

Dates	Location/Operation/Mission	U.S. Naval Forces
Jun - Aug 2009	Amphibious Southern Partnership Station 2009 Multinational Maritime Partnership U.S. Southern Command (SOUTHCOM)	USS Oak Hill (LSD 51) COMDESRON 2 22nd Marine Expeditionary Unit Navy Combat Camera
Aug 2009	Taiwan / Typhoon Morakot Recovery / FHA	USS Denver (LPD 9), CH-53s
27 Sep -13 Oct 2009	Republic of the Philippines / Tropical Storm Ketsana / FHA	USS Harpers Ferry (LSD 49) USS Tortuga
29 Sep - 4 Oct 2009	America Samoa / Tsunami Relief / HA	USS Ingraham (FFG 61)
02 Oct -17 Oct 2009	Indonesia / FHA	CTF 76 COMPHIBRON 11 USS Denver (LPD 9) USS McCampbell (DDG 85) USNS Richard E Byrd (T-AKE 4) USNS Walter S. Diehl (T-AO 193) CTF 72 DET 31 MEU 11 MEU
30 Oct - 07 Nov 2009	WESTPAC / MCPI / UNSCR	USS Ingraham (FFG 61)
Oct - Dec 2009	Amphibious Southern Partnership Station 2009 Multinational Maritime Partnership U.S. Southern Command (SOUTHCOM)	USS Wasp (LHD 1) COMDESRON 40 Marine Heavy Helicopter Squadron 461 Fox Company 2nd Battalion 9th Marines 8th Communication Battalion 8th Engineering Support Battalion Marine Dental Echelon
Oct 2009 - Apr 2010	Counter Illicit Trafficking (CIT) OPS U.S. Southern Command (SOUTHCOM)	USS McInerney (FFG 8) USS McClusky (FFG 41)
Oct 2009 - May 2010	Oceanographic Southern Partnership Station 2009/2010	USNS Henson (T-AGS 63)
Nov 2009 - Mar 2010	Oceanographic Southern Partnership Station 2009/2010	USNS Sumner (T-AGS 61)
Nov - Nov 2009	Divi Airlines Plane Crash Recovery OPS Southern Caribbean	USNS Henson (T-AGS 63)
Jan 2010 - Ongoing	Operation Unified Response / Haiti Earthquake Relief	USS Carl Vinson (CVN 70) USS Bataan (LHA 5) USS Gunston Hall (LSD 44) USS Fort McHenry (LSD 43) USS Carter Hall (LSD 50) USS Normandy (CG 60) USS Underwood (FFG 36) 22nd Marine Expeditionary Unit (MEU 22) USS Nassau (LHD 4) USS Mesa Verde (LPD 19) USS Ashland (LSD 48) 24th Marine Expeditionary Unit (MEU 24) USS Higgins (DDG 76)

Dates	Location/Operation/Mission	U.S. Naval Forces
		USS Bunker Hill (CG 52) USNS Comfort (T-AH 20) USNS Grasp (T-ARS 51) USNS Henson (T-AGS-63) USNS Sacagawea (T-AKE 2) USNS Sumner (T-AGS-61) USNS 1st LT Jack Lummus (T-AK 3011) USNS PFC Dewayne T. Williams (T-AK 3009) USNS Big Horn (T-AO-198)
Jan - Apr 2010	Op UNIFIED Response / Haiti HADR Operations	USS Carl Vinson (CVN 70) USS Bunker Hill (CG 52) USS Bataan (LHD 5) USS Carter Hall (LSD 50) USS Ft McHenry (LSD 43) USNS Grasp (T-ARS 51) USNS Comfort (T-AH 20) USNS Sacagawea (T-AKE 2) USNS Dewayne T Williams (T-AK 3009) USS Higgins (DDG 76) USS Nassau (LHA 4) USS Gunston Hall (LSD 44) USS Mesa Verde (LPD 19) USS Ashland (LSD 48) USNS Lewis and Clark (T-AKE 1) USS Normandy (CG 60) USS Underwood (FFG 36)
Jan - Apr 2010	USS Carl Vinson Southern Seas 2010 U.S. Southern Command (SOUTHCOM)	USS Carl Vinson (CVN 70) COMCARSTRKGRU ONE
Jan - Jun 2010	Africa Partnership Station	USS Gunston Hall (LSD 44) USS Samuel B Roberts (FFG 58) HSV-2 Swift USS Nicholas (FFG 47)
Jan - Dec 2010	Counter-Piracy Operations in the GOA (Gulf of Aden) / HOA (Horn of Africa) Somali Basin / Arabian Sea	Various ships
Jan - Dec 2010	Counter-Illicit Trafficking (CIT) OPS U.S. Southern Command (SOUTHCOM)	USS McClusky (FFG 41) USS McInerney (FFG 8) USS Rodney M Davis (FFG 60) USS Underwood (FFG 36) USS Jarrett (FFG 33) USS Truxtun (DDG 103) USS Doyle (FFG 39)
Feb - Mar 2010	Op PODIUM (Olympics)	USS Cape St George (CG 71) USS Momsen (DDG 92) USS Shoup (DDG 86)
Feb - Mar 2010	Black Sea OPS	USS John L Hall (FFG 32)
Feb - Apr 2010	USS Freedom Early Deployment U.S. Southern Command (SOUTHCOM)	USS Freedom (LCS 1)

Dates	Location/Operation/Mission	U.S. Naval Forces
Apr - Sep 2010	Op SOUTHERN SEAS 2010	USS Klakring (FFG 42)
Apr - Sep 2010	Op DEEPWATER HORIZON	USN Blimp Shallow Water Skimmers x 27 Harbor Buster x 4 Tow Boats x 35
May - Sep	Op SOUTHERN PARTNERSHIP STATION	HSV-2 Swift USS Freedom (LCS 1) USS New Orleans (LPD 18) USNS Grasp (T-ARS 51)
May - Sep 2010	Op PACIFIC PARTNERSHIP 2010	USNS Mercy (T-AH 19)
Jun - July 2010	Ex RIMPAC 2010	USS Ronald Reagan (CVN 76) USS Chancellorsville (CG 62) USS Bonhomme Richard (LHD 6) USS Comstock (LSD 45) USS Freedom (LCS 1) USS Paul Hamilton (DDG 60) USS McClusky (FFG 41) USS Chosin (CG 65) USNS Bridge (T-AOE 10) USNS Guadalupe (T-AO 200) USNS Yukon (T-AO 202) USS Navajo (AT 64) USS Sioux (ATF 75) USS Cleveland (LPD 7) USS Lake Erie (CG 70) USS Hopper (DDR 70) USS Reuben James (FFG 57) USS Sampson (DDG 102) USS Benfold (DDG 65) USS Ford (FFG 54) USS Pioneer (MCM 9) USS Devestator (MCM 6) USS Rushmore (LSD 47) USS Columbia (SSN 771) USS Columbus (SSN 762) USS Bremerton (SSN 698)
Aug - Present	Op Pakistan Flooding HA/DR	USS Peleliu (LHA 5) USS Pearl Harbor (LSD 52) USS Ponce (LPD 15
Jul - Jul 2010	Ex CARAT Singapore 2010	USS Tortuga (LSD 46) USS Chung-Hoon (DDG 93) USS Princeton (CG 59) USS Jacksonville (SSN 699)
Jul - Jul 2010	Op FRUKUS 2010	USS Mount Whitney (LCC 20)
Jul - Nov 2010	Op CONTINUING PROMISE 2010	USS Iwo Jima (LHD 7)
Aug - Aug 2010	Ex PANAMAX 2010	USNS Grasp (T-ARS 51)
Sep - Oct 2010	Op RAZOR II	USS Kearsage (LHD 3) USS Gonzalez (DDG 66)

Dates	Location/Operation/Mission	U.S. Naval Forces
Oct - Oct 2010	Ex JOINT WARRIOR 10-2	USS Bainbridge (DDG 96) USS Nitze (DDG 94) USS Stout (DDG 55)
Oct 2010 - Present	Op Philippines Typhoon HA/DR	USS George Washington (CVN 73) USS Cowpens (CG 63) USS John S McCain (DDG 56) USS Fitzgerald (DDG 62) USS Essex (LHD 2) USS Denver (LPD 9) USS Harpers Ferry (LSD 49)
Jan 2011 - Present	Op AFRICA PARTNERSHIP STATION	USS Samuel B Roberts (FFG 58) HSV Swift (HSV 2) USS Robert G Bradley (FFG 49) USS Stephen W Groves (FFG 29)
Jan - Present	Counter-Piracy Operations in the GOA (Gulf of Aden) / HOA (Horn of Africa) Somali Basin / Arabian Sea	Various ships
Jan - Present	Counter Transnational Organized Crime (C-TOC) OPS U.S. Southern Command (SOUTHCOM)	USS Jarrett (FFG 33) USS Gary (FFG 51) USS Rentz (FFG 46) USS Carr (FFG 52) USS Ingraham (FFG 61) USS Doyle (FFG 39) USNS Lewis and Clark (T-AKE 1) USS Topeka (SSN 754) USS Asheville (SSN 758)
Jan - Present	Op SOUTHERN PARTNERSHIP STATION 2011	HSV Swift (HSV 2) USS Oak Hill (LSD 51) - (primarily supporting C-TOC mission) USS Gunston Hall (LSD 44) USNS Pathfinder (T-AGS 60)
Jan - Present	Op OCEAN SHIELD	USS Enterprise (CVN 65) USS Leyte Gulf (CG 55) USS Bulkley (DDG 84) USS Sterett (DDG 104) USS Carl Vinson (CVN 70) USS Bunker Hill (CG 52)
Jan - Present	Op SHARP SENTRY	USS Ramage (DDG 61) USS Stout (DDG 55)
Jan - Present	Op ATLANTIC SENTRY	USS The Sullivans (DDG 68) USS Monterey (CG 61)
Jan - Present	Op NEW DAWN	USS Carl Vinson (CVN 70) USS Bunker Hill (CG 52) USS Ronald Reagan (CVN 76) USS Chancellorsville (CG 62) USS George H W Bush (CVN 77) USS Gettysburg (CG 64) USS John C Stennis (CVN 74) USS Mobile Bay (CG 53)

Dates	Location/Operation/Mission	U.S. Naval Forces
Jan - Present	Op ENDURING FREEDOM	USS Abraham Lincoln (CVN 72) USS Cape St George (CG 71) USS Sterrett (DDG 104) USS Shoup (DDG 86) USS Carl Vinson (CVN 70) USS Bunker Hill (CG 52) USS Leyte Gulf (CG 55) USS Enterprise (CVN 65) USS Ronald Reagan (CVN 76) USS Chancellorsville (CG 62) USS George H W Bush (CVN 77) USS Gettysburg (CG 64) USS John C Stennis (CVN 74) USS Mobile Bay (CG 53)
Feb 2011	Ex PROUD MANTA	USS Stout (DDG 55) USS Memphis (SSN 691)
Feb - Mar 2011	Ex NOBLE MARINER	USNS Kanawha (T-AO 196)
Feb - Mar 2011	Ex KEY RESOLVE/FOAL EAGLE 11	USS Stethem (DDG 63) USS Avenger (MCM 1) USS Guardian (MCM 5)
Mar 2011	Ex OBANGAME EXPRESS	USS Robert G Bradley (FFG 49)
Mar - Apr 2011	Ex NOBLE DINA	USS Stout (DDG 55) USNS Kanawha (T-AO 196) USNS LCPL Roy M Wheat (T-AK 3016)
Mar - Apr 2011	Op TOMODACHI	USS McCampbell (DDG 85) USS Preble (DDG 88) USS Mustin (DDG 89) USS Cowpens (CG 63) USS Curtis Wilbur (DDG 54) USS Fitzgerald (DDG 62) USNS Bridge (T-AOE 10) USS Blue Ridge (LCC 19) USS Ronald Reagan (CVN 76) USS Chancellorsville (CG 62) USS Shiloh (CG 67) USS Essex (LHD 2) USS Germantown (LSD 42) USS Harpers Ferry (LSD 49) USS Tortuga (LSD 46) USNS Safeguard (T-ARS 50)
Mar - Aug 2011	Op PACIFIC PARTNERSHIP 2011	USS Cleveland (LPD 7)
Mar - Oct 2011	Op ODYSSEY DAWN / UNIFIED PROTECTOR	USS Barry (DDG 52) USS Ponce (LPD 15) USS Kearsarge (LHD 3) USS Scranton (SSN 756) USS Florida (SSGN 728) USS Providence (SSN 719) USS Halyburton (FFG 40) USS Carter Hall (LSD 50)

Dates	Location/Operation/Mission	U.S. Naval Forces
		USS Bataan (LHD 5) USS Whidbey Island (LSD 41) USS Mesa Verde (LPD 19) USS Mount Whitney (LCC 20) USNS Lewis and Clark (T-AKE 1) USNS Arctic (T-AOE 8) USNS Robert E Peary (T-AKE 5) USNS Big Horn (T-AO 198) USNS LCPL Roy M Wheat (T-AK 3016) USNS Kanawha (T-AO 196) USS Monterey (CG 61) USS Mahan DDG 72) USS Stout (DDG 55) USNS 2nd Lt John P Bobo (T-AK 3008)
Apr 2011	Ex JOINT WARRIOR 11-1	USS Forrest Sherman (DDG 98) USS Samuel B Roberts (FFG 58) USNS Big Horn (T-AO 198)
Apr - May 2011	Ex SAHARAN EXPRESS	USS Robert G Bradley (FFG 49)
Apr - Aug 2011	Op CONTINUING PROMISE 2011	USNS Comfort (T-AH20)
Apr - Sep 2011	Op SOUTHERN SEAS 2011	USS Boone (FFG 28) (supporting C-TOC mission) USS Thach (FFG 43) USS Nitze (DDG 94) (Apr-Jun)
May 2011	Ex CARAT THAILAND / INDONESIA	USS Reuben James (FFG 57) USS Howard (DDG 83) USS Tortuga (LSD 46) USNS Safeguard (T-ARS 50)
May 2011	Ex TRIDENT FURY	USS Lake Erie (CG 70) USS Devastator (MCM 6) USS Chief (MCM 14)
May 2011	JCS CSG COMPTUEX	USS John C Stennis (CVN 74) USS Mobile Bay (CG 53) USS Pinckney (DDG 91) USS Kidd (DDG 100) USS Dewey (DDG 105) USS Wayne E Meyer (DDG 108) USS John Paul Jones (DDG 53) USS Ingraham (FFG 61)
May 2011	IMDEX 11	USS McCampbell (DDG 85)
May 2011	Ex TERMINAL FURY CPX 11-A	USS Ronald Reagan (CVN 76)
May 2011	Ex TERMINAL FURY CPX 11-B	USS Carl Vinson (CVN 70)
May 2011	Ex SAXON WARRIOR	USS George H W Bush (CVN 77) USS Gettysburg (CG 64) USS Mitscher (DDG 57) USS Truxton (DDG 103)
May - Jun 2011	Ex BOLD MONARCH	SRS-RCS Unit Deep Submergence Unit Det

Dates	Location/Operation/Mission	U.S. Naval Forces
May - Jun 2011	Op PHOENIX EXPRESS 11	USS Stephen W Groves (FFG 29) USS Robert G Bradley (FFG 49) USNS Wheat (T-AK 3016)
Jun 2011	Ex SEA BREEZE 11	USS Anzio (CG 68) USS Monterey (CG 61) USNS Grasp (T-ARS 51)
Jun 2011	Ex BALTIC OPERATIONS 11 (BALTOPS)	COMCARSTRKGRU EIGHT USS Mount Whitney (LCC 20) USS Phillipine Sea (CG 58) USNS 2nd Lt John P Bobo (T-AK 3008)
Jun 2011	JCS CSG JTFEX	USS John C Stennis (CVN 74) USS Mobile Bay (CG 53) USS Pinckney (DDG 91) USS Kidd (DDG 100) USS Dewey (DDG 105) USS Wayne E Meyer (DDG 108)
Jun 2011	EX CARAT MALAYSIA	USS Howard (DDG 83) USS Tortuga (LSD 46) USNS Safeguard (T-ARS 50) USS Ford (FFG 54) USS LaJolla (SSN 701)
Jun 2011	Ex NORTHERN EDGE	USS Lake Erie (CG 70) USS Decatur (DDG 73) USS Chafee (DDG 90) USNS Rainier (T-AOE 7)
Jun 2011	Ex SEACAT	USS Chung-Hoon (DDG 93) USS Howard (DDG 83) USNS Safeguard (T-ARS 50)
Jun - Jul 2011	Op FRUKUS 2011	COMCARSTRKGRU TEN USS James E Williams (DDG 95)
Jun - Jul 2011	SPANISH PHIBLEX	USS Bataan (LHD 5) USS Mesa Verde (LPD 19) USS Whidbey Island (LSD 41)
Jun - Jul 2011	Ex CARAT PHILIPPINES	USS Howard (DDG 83) USS Chung-Hoon (DDG 93) USNS Safeguard (T-ARS 50)
Jul 2011	BRIDEX	USS Preble (DDG 88)
Jul 2011	Ex TRIDENT WARRIOR	USS Wasp (LHD 1) USS Vicksburg (CG 69) USS Cole (DDG 67) USS Donald Cook (DDG 75)
Jul 2011	ROKN SUBEX	USS Texas (SSN 775)

Dates	Location/Operation/Mission	U.S. Naval Forces
Jul 2011	Ex TALISMAN SABRE	USS Blue Ridge (LCC 19) USS George Washington (CVN 73) USS Cowpens (CG 63) USS Curtis Wilbur (DDG 54) USS Germantown (LSD 42) USS McCambell (DDG 85) USS Fitzgerald (DDG 62) USS Albuquerque (SSN 706) USNS Rapahannock (T-AO 204)
Jul 2011	USN/JMSDF/ROKN TRILATERAL SAREX	USS Ford (FFG 54)
Jul 2011	Ex CUTLASS EXPRESS 11	USS Samuel B Roberts (FFG 58)
Jul - Aug 2011	ROMANIAN PHIBLEX	USS Whidbey Island (LSD 41)
Jul - Aug 2011	JMSDF PASSEX	USS Nitze (DDG 94) USS Carr (FFG 52) USNS Arctic (T-AOE 8)
Jul - Aug 2011	Ex RELIANT MERMAID	USS Ramage (DDG 61) USNS Big Horn (T-AO 198)
Aug 2011	Ex PANAMAX 2011	USS Thach (FFG 43)
Aug 2011	JCS CSG CSG USWEX 11-3	USS John C Stennis (CVN 74) USS Mobile Bay (CG 53) USS Pinckney (DDG 91) USS Kidd (DDG 100) USS Dewey (DDG 105) USS Wayne E Meyer (DDG 108) USS Paul Hamilton (DDG 60) USS Olympia (SSN 717) USS Louisville (SSN 724)
Aug 2011	Ex CARAT SINGAPORE	USS Chung-Hoon (DDG 93) USS Curtis Wilbur (DDG 54) USS Bremerton (SSN 698) USNS Alan Shepard (T-AKE 3) USS Ford (FFG 54)
Sep 2011	Ex CARAT BANGLADESH	USS Kidd (DDG 100) USS Ford (FFG 54) USS Defender (MCM 2) USNS Safeguard (T-ARS 50)
Sep - Oct 2011	ABE CSG COMPTUEX	USS Abraham Lincoln (CVN 72) USS Cape St George (CG 71) USS Sterrett (DDG 104) USS Momsen (DDG 92) USS McClusky (FFG 41) USS John Paul Jones (DDG 53) USS Milius (DDG 69)
Sep - Oct 2011	Ex JOINT WARRIOR 11-2	USS Arleigh Burke (DDG 51) USS Simpson (FFG 56) USNS Kanawha (T-AO 196)

Dates	Location/Operation/Mission	U.S. Naval Forces
Sep - Oct 2011	Op ODYSSEY GUARD	USS Mesa Verde (LPD 19)
Sep - Oct 2011	Ex CARAT BRUNEI	USS Dewey (DDG 105) USS Pinckney (DDG 91)
Oct 2011	CVN CSG JTFEX	USS Carl Vinson (CVN 70) USS Bunker Hill (CG 52) USS Halsey (DDG 97) USS Stockdale (DDG 106) USS McClusky (FFG 41) USS Abraham Lincoln (CVN 72) USS Cape St George (CG 71) USS Sterrett (DDG 104) USS Momsen (DDG 92) USS Sampson (DDG 102) USS Bonhomme Richard (LHD 6) USS Ruschmore (LSD 47)
Oct 2011	Ex CLEAR HORIZON 11	USS Patriot (MCM 7) USS Guardian (MCM 5)
Oct 2011	CSOFEX 11	USS McCampbell (DDG 84) USS Curtis Wilbur (DDG 54)
Oct 2011	Ex NORWEIGIAN PASSEX	USS Arleigh Burke (DDG 51)
Oct 2011	PHIBLEX	USS Essex (LSD 2) USS Germantown (LSD 42) USS Denver (LPD 9)
Oct 2011	Ex CARAT CAMBODIA	USS Cromellin (FFG 37) USNS Safeguard (T-ARS 50) USS Kidd (DDG 100)
Oct 2011	MCM PASSEX	USS Chief (MCM 14) USS Champion (MCM 4)
Oct - Nov 2011	ANNUALEX 23G	USS George Washington (CVN 73) USS Cowpens (CG 63) USS Lassen (DDG 82) USS Wayne E Meyer (DDG 108) USS Stethem (DDG 63) USS Dewey (DDG 105) USS Curtis Wilbur (DDG 54) USS Mustin (DDG 89) USS Albuquerque (SSN 706) USS Columbia (SSN 771) USS Tortuga (LSD 46) USS Patriot (MCM 7) USS Guardian (MCM 5) USNS Able (T-AGOS 20)
Nov 2011	Ex GRAMPUS	USS The Sullivans (DDG 68) USS Montpelier (SSN 765)

Dates	Location/Operation/Mission	U.S. Naval Forces
Nov 2011	Ex KOA KAI 12-1	USS Chaffe (DDG 90) USS Okane (DDG 77) USS Crommelin (FFG 37) USS Hawaii (SSN 776) USS Bremerton (SSN 698) USNS Washington Chambers (T-AKE 11)
Nov 2011	Ex RAPID ARROW	USS The Sullivans (DDG 68)

* CJTF-Combined Joint Task Force; CTF-Commander, Task Force; HSC-Helicopter Sea Combat Squadron; HM-Helicopter Mine Countermeasures Squadron; HSL-Helicopter Anti-Submarine Warfare Squadron (Light) SEAL-Sea Air Land Teams; MDSU- Mobile Diving and Salvage Unit; MEU-Marine Expeditionary Unit; MEF-Marine Expeditionary Force; SOC-Special Operations Capable; NSW-Naval Special Warfare; TRAP-Tactical Recovery of Aircraft and Personnel; Seabees-Naval Construction Battalions; FAST-Fleet Antiterrorism Support Team

APPENDIX B
GLOSSARY

AADC	Area Air Defense Commander
AAG	Advanced Arresting Gear
AARGM	Advanced Anti-Radiation Guided Missile
AAW	Anti-Air Warfare
ABNCP	Airborne Command Post
ACAT	Acquisition Category
ACB	Amphibious Construction Battalion, or, Advanced Capability Build
ACCES	Advanced Cryptologic Carry-on Exploitation System
ACDS	Advanced Combat Direction System
ACS	Aerial Common Sensor, or, Aegis Combat System
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
AFB	Air Force Base
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
ALFS	Airborne Low-Frequency Active Sonar
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
ATA	Automatic Target Acquisition
ATC	Air Traffic Control
ATD	Advanced Technology Demonstration, or, Aircrew Training Device
ATDLS	Advanced Tactical Data Link System
AT- FLIR	Advanced Targeting Forward-Looking Infrared
ATM	Asynchronous Transfer Mode
ATT	Anti-Torpedo Torpedo
ATWCS	Advanced Tomahawk Weapon Control
AWACS	Airborne Warning and Control System
AWS	Aegis Weapon 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 Closure
C2P	Command and Control Processor
C4I	Command, Control, Communications, Computers, 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
CANES	Consolidated Afloat Network Enterprise Services
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	Capability 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
CENTRIXS	Combined Enterprise Regional Information Exchange System
CFFC	Commander, Fleet Forces Command
CG	Guided Missile 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
CMCO	Counter Mine Counter Obstacle
CND	Computer Network Defense
CNIC	Commander, Naval Installations Command
CNO	Chief of Naval Operations
CNRC	Commander, Naval Recruiting Command
CNRRR	Commander, Naval Reserve Recruiting Region
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	Capability 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
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
DCL	Detection, Classification, and Localization
DCMS	Director, Communications Security Material Systems
DCNO	Deputy Chief of Naval Operations
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/ PRS	Defense Personnel Record Imaging System/EM-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
EHF	Extremely High Frequency
EIS	Environmental Impact Statement
EKMS	Electronic Key Management System
ELINT	Electronic Intelligence
ELC	Enhanced Lethality Cartridge
EMALS	Electromagnetic Aircraft Launch System
EMD	Engineering and Manufacturing Development
EMPRS	Electronic Military Personnel Record System
EMW	Expeditionary Maneuver Warfare
EOC	Early Operational Capability
EOD	Explosive Ordnance Disposal
EOID	Electro-Optic Identification
ER	Extended Range
ER AAW	Extended Range Anti-Air Warfare
ERAM	Extended Range Active Missile
ERM	Extended Range Munition
ERNT	CNO Executive Review of Navy Training
ESE	Electronic Surveillance Enhancement
ESG	Expeditionary Strike Group

ESM	Electronic Support Measures
ESSI	Enhanced Special Structural Inspection
ESSM	Evolved Sea Sparrow Missile
ETC	Echo Tracker Classifier
EUCOM	U.S. European Command
EURCENT	European Central (NCTAMS)
EW	Electronic Warfare
EXCEL	Excellence through Commitment to Education and Learning
FARP	Forward Arming and Refueling Point
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
GWOT	Global War on Terror
HA/DR	Humanitarian Assistance/Disaster Relief
HARM	High-Speed Anti-Radiation Missile
HD/LD	High-Demand/Low-Density
HDR	High Data-Rate
HF	High Frequency
HGHS	High Gain High Sensitivity
HM&E	Hull, 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
HSI	Human Systems Integration
IA	Information Assurance
IATF	IA Technical Framework
IBS	Integrated Broadcast Service
I&W	Indications & Warning
IBS/JTT	Integrated Broadcast Service/ Joint Tactical Terminal
ICAO	International Civil Aviation Organization
ICAP	Improved Capability
ICD	Initial Capabilities Document
ICP	Integrated Common Processor
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
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
IRST	Infrared Search and Track
IS	Information Systems
ISDN	Integrated Services Digital Network
ISNS	Integrated Shipboard Network System
ISO	Investment Strategy Options
ISPP	Integrated Sponsor's Program Proposal
ISR	Intelligence, Surveillance, Reconnaissance
ISRT	Intelligence, Surveillance, Reconnaissance, and Targeting
ISS	Installation Subsystem
ISS	Information Superiority/Sensors
ISSP	Information Systems Security Program
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
JFCOM JPO	Joint Forces Command Joint Program Office
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
KDP	Key Decision Point
KPP	Key Performance Parameter
KSA	Key Systems Attribute
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
LD/HD	Low-Density/High Demand
LIDAR	Light Detection and Ranging System
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
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
MCTUAS	Marine Corps Tactical Unmanned Aircraft System
MCU	Mission Computer Upgrade
MDA	Missile Defense Agency
MDR	Medium Data Rate
MDS	Multi-function Display System
MEB	Marine Expeditionary Brigade
MEDAL	Mine Warfare and Environmental Decision Aids Library
MEF	Marine Expeditionary Force
METOC	Meteorological and Oceanographic Sensors
MEU	Marine Expeditionary Unit
MEU(SOC)	Marine Expeditionary Unit (Special Operations Capable)
MF	Medium Frequency
MFL	Multi-Frequency Link
MFR	Multi-Function Radar
MFTA	Multi-Function Towed Array
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
MK	Mark
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
MRMUAS	Medium-Range Maritime Unmanned Aerial System
MRUUV	Mission-Reconfigurable Unmanned Undersea Vehicle
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
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
NCWES	Network-Centric Warfare Electronic Support
NDI	Non-Developmental Item
NEC	Naval Enlistment Classification
NEO	Non-Combatant Evacuation Operations
NEP	Navy Enterprise Portal
NEPLO	National Emergency Preparedness Liaison Officer
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
NGEN	Next Generation Enterprise Network
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 Construction 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
NNSOC	Naval Network and Space Command
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
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
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
OCONUS	Outside Continental United States
OED	OSIS Evolutionary Development
OEF	Operation Enduring Freedom
OEO	Other Expeditionary Operations
OGB	Optimized Gun Barrel
OIF	Operation Iraqi Freedom
OIPT	Overarching Integrated Product Team
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
PHIBGRU	Amphibious Group
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
PTAN	Precision Terrain Aided Navigation
PUMA	Precision Underwater Mapping
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
RCC	Regional Combatant Commander
RCOH	Nuclear Refueling/Complex Overhaul
RD&A	Research, Development, and Acquisition
RDC	Rapid Deployment Capability
RDT&E	Research, Development, Test and Evaluation
REPLO	Regional Emergency Preparedness Liaison Officer
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
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)
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
SEPLO	State Emergency Preparedness Liaison Officer
SEWIP	Surface Electronic Warfare Improvement Program
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	Sensor Subsystem
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
SS-SPY	Solid State- SPY (radar)
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
TacLAN	Tactical Local Area Network
TACS	Tactical Air Control System
TACTAS	Tactical Towed Array System
TACTOM	Tactical Tomahawk
TADIL-J	Tactical Digital Information Link - Joint Service
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
TI	Tach Insertion
TIBS	Tactical Information Broadcast Service
TIDS	Tactical Integrated Digital System
TIMS	Training Integrated Management System
TIS	Trusted Information System
TIS	Tactical Interface Subsystem
TLAM	Tomahawk Land-Attack Cruise Missile
TLR	Top Level Requirements
TOA	Total Obligational Authority, or, Tables of Allowance
TOC	Total Ownership Costs
TOW	Tube-launched, Optically-tracked, Wire-guided (missile)
TPPU	Task, Post, Process, Use
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
UCAS-D	Unmanned Combat Aircraft System Demonstration
UCLASS	Unmanned Carrier-Launched Airborne Surveillance and Strike
UCT	Underwater Construction Team
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
USW-DSS	Undersea Warfare-Decision Support System
UUV	Unmanned Undersea Vehicle
UWS	Underwater Segment
UXO	Unexploded Ordnance
VCNO	Vice Chief of Naval Operations
VERTREP	Vertical (underway) Replenishment
VHA	Variable Housing Allowance
VHF	Very High Frequency
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

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http://www.navy.mil/navydata/policy/seapower/npg12/top-npg12.pdf