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BEFORE THE

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OF THE

HOUSE ARMED SERVICES COMMITTEE ON

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Mr. Chairman, distinguished members of the Subcommittee, thank you for this opportunity to appear before the Projection Forces Subcommittee to discuss "Navy Critical Enablers - Department of the Navy Program and Budget Request for Anti-Submarine Warfare, Mine Countermeasures, Ship Self-Defense, and Naval Surface Fire Support."

The roadmap for providing our nation the desired capabilities in these critical areas is defined in Sea Power 21. The objective of Sea Power 21 is to ensure that our nation possesses credible combat capability on scene to promote regional stability, to deter aggression throughout the world, to assure access of joint forces, and to fight and win should deterrence fail. Sea Power 21 guides the Navy's transformation from a threat–based platform centric structure to a capabilities-based, fully integrated force.

The pillars of Sea Power 21 -- Sea Strike, Sea Shield, Sea Base -- are integrated by FORCEnet, the means by which the power of sensors, networks, weapons, warriors, and platforms are harnessed in a networked combat force.

- **Sea Strike** is the projection of precise and persistent offensive power. It leverages persistence, precision, stealth, and new force packaging concepts to increase operational tempo and reach. It includes strikes by air, missiles, and maneuver by Marine Air Ground Task Forces (MAGTF) supported by sea based air and long-range gunfires.

- **Sea Shield** is the projection of layered defensive power. It seeks maritime superiority to assure access, and to project defense overland. It provides a secure operating environment for sea-based forces.

- **Sea Base** is the projection of operational independence. It provides the Joint Force Commander the ability to exploit Expeditionary Maneuver Warfare, and the capability to retain command and control and logistics at mobile, secure locations at sea.

- **FORCEnet** is the operational construct and architectural framework for naval warfare in the joint, information age. It integrates warriors, sensors, networks, command and control, platforms and weapons into a networked, distributed combat system.

Using the framework established by Sea Power 21, we are developing the networked force, a force that will achieve rapid access through improved Anti-Submarine Warfare, Mine Countermeasures, Ship Self-Defense, and Naval Surface Fire Support. This networked force will possess the strategic agility and persistence necessary to prevail in the continuing global war on terrorism (GWOT), as well as the speed and overwhelming power to seize the initiative and swiftly defeat any regional peer or near peer competitor in major combat operations (MCO).

The Navy and Marine Corps Team of the future must be capabilities-based and threat-oriented. Through agility and persistence, our Navy and Marine Corps Team needs to be poised for the "close-in knife fight" that is the GWOT, able to act immediately to engage the fleeting target.

The challenge is to simultaneously "set the conditions" for a MCO while continuing to fight the GWOT, with the understanding that the capabilities required for the GWOT cannot necessarily be assumed to be a lesser-included case of an MCO. Our force must be the right mix of capabilities that balances persistence and agility with power and speed in order to fight the GWOT while prepared to win a MCO. To do so, we must properly posture the Force in terms of greater operational availability from platforms that are much more capable as a distributed, networked force.

While the fabric of our fighting force will still be the power and speed needed to seize the initiative and swiftly defeat any regional threat, FORCEnet's pervasive awareness command control communications computers intelligence surveillance and resonance (C4ISR) will be more important than mass. And, because of its access from the sea, the Navy and Marine Corps are focusing significant effort and analysis in support of joint combat power projection by leveraging the maneuver space of the oceans through Seabasing. Seabasing is a national capability that will project and sustain naval power and joint forces, assuring joint access by leveraging the operational maneuver of sovereign, distributed and fully networked forces operating globally from the sea, while accelerating expeditionary deployment and employment timelines. This objective is only achievable if we can assure access to the maneuver space of our choosing at the time of our choosing. This assured access is clearly dependant on our capabilities in Anti-Submarine Warfare, Mine Countermeasures, Ship Self-Defense, and Naval Surface Fire Support.

Today's Fleet combat system computing architectures are performance limited and expensive to upgrade, and cannot support emerging Sea Power 21 requirements. The Fiscal Year 2006 President's Budget request includes $197.9M for implementing an enterprise wide Open Architecture (OA). OA is the critical enabler for achieving the integrated warfare systems dictated by Sea Power 21. OA institutes the business and technical precepts and implementation standards essential for achieving capability upgrades and truly integrated warfare systems. Development and implementation of modular warfighting software functions built and tested once and then used repetitively throughout multiple systems, will enable common, interoperable capabilities to be fielded more quickly and at reduced cost. This approach is fundamental to achieving integrated warfare systems and the key to an affordable 21st Century Joint combat capability.

The Fiscal Year 2006 Budget request reflects the investments that will most improve our critical warfighting capabilities monitored by this subcommittee by developing and investing in future sea based and expeditionary capabilities for the Navy and Marine Corps. This budget request maximizes our Nation's return on its investment by positioning us to meet today's challenges -- from peacekeeping/stability operations to GWOT operations and small-scale contingencies -- and by transforming the force for future challenges.

To this end, the technological innovations and human-systems integration advances in future capabilities delivered by upgrading current and developing future platforms remains critical. With your continued support, our future combat forces will sustain operations in forward areas longer, be able to respond more quickly to emerging contingencies, and generate more sorties and simultaneous attacks against greater numbers of multiple aim points and targets with greater effect than our current fleet.

## ANTI-SUBMARINE WARFARE

The recently released Anti-Submarine Warfare (ASW) Master Plan provides a single source of top level, authoritative information and guidance for the U.S. Navy's present and future ASW efforts. It summarizes the threat submarine development trends to highlight areas of concern to U.S. planners and it describes the end-to-end U.S. system, sensors, signal processing, automated fire control systems, lethal weapons and concept of operations (CONOPS) required to defend against the submarine threat. It also describes the key organizational elements, acquisition decision process, directed science and technology efforts and the programs of record needed to successfully execute the ASW CONOPS for the 21st Century and to help industry focus its discretionary efforts.

### Task Force ASW

Task Force ASW (TF ASW) was formed in February 2003, with the guidance to develop a new way to conduct ASW and to investigate available technology and infuse it into the new warfighting concept of operations, which was approved by CNO in December 2004. Through 2004, TF ASW conducted three experiments with the express purpose to develop a distributed sensor system capability. In 2005 TF ASW has plans to continue efforts to develop ASW distributed capability in acoustic and non-acoustics areas that will be supported by robust netted systems. These efforts are expected to continue into Fiscal Year 2006.

### Submarine Technology Development and Insertion

This program is comprised of Advanced Submarine System Development (ASSD) and VIRGINIA Class Technology Insertion RDT&E and SCN funding lines. ASSD develops and demonstrates the most promising submarine transformational technologies for rapid incorporation into fleet units, including combat systems, payloads and sensors. Its focus is experimentation using Sea Trial and the three warfighting pillars of SEA POWER 21, including capabilities to gain and sustain battle force access, develop and share knowledge, deter conflict, counter weapons of mass destruction and project power with surprise. In addition $97M has been allocated between Fiscal Year 2005 and Fiscal Year 2008 to a joint DARPA/Navy "TANGO BRAVO" initiative to overcome selected technological barriers to enable design options for a reduced-cost submarine.

### Advanced Processing Build

The Advanced Processing Build (APB**)** process produces software builds to improve functionality to submarine combat systems programs. The primary recipients of the APB's are the AN/BQQ-10 Acoustic Rapid Commercial Off-the-Shelf Insertion program and the AN/BYG-1 Combat Control Systems program. Annual software deliveries were made in support of submarine modernization. APB's also provide functionality to the Integrated Undersea Surveillance System program as well as other surface, air, and surveillance programs. The software enhancements are produced via a four-step evolutionary process that involves Navy laboratories, academia, and small and large businesses.

The Fiscal Year 2006 President's Budget requests $62.23M for Submarine Combat System Improvement within which APBs are allocated $48.23M to continue development and transition of APBs for Submarine Combat System Improvements. Recent APB-Acoustics improvements have focused on close aboard situational awareness, precision underwater mapping, sonar

planning and environmental monitoring, acoustic contact correlation and integration with tactical control, and processing enhancements for the hull and sphere arrays. These enhancements will continue to be refined over the near term in concert with a special focus on expanding High Frequency Active close aboard capabilities. Future near term efforts will focus on improving the acoustic contribution to ASW in the littorals. Primary candidates are thin-line towed array signal processing, precision tracking and refined automation. Recent APB - Tactical efforts focused on delivery of the first automated close encounter management tool-set for submarine combatants. Future near term efforts will focus on enhancing this functionality and on improving the tactical commander's ability to manage close in and high density scenarios through advanced target motion analysis, contact management, tactical scene rendering, sensor performance prediction models, search planning, uncertainty management, acoustic and non-acoustic vulnerability management, close encounter decision management, and automation.

**Advanced Towed Array Systems**

The Fiscal Year 2006 President's Budget requests $36.2M to continue development and procurement of advanced towed array systems, such as the TB-29A/33 Submarine Thin-line Towed Array System. The TB-29A submarine thin-line towed array is a COTS version of the legacy TB-29 towed array. These arrays will be used for backfit on Los Angeles (SSN-688 & SSN 688I) and Seawolf (SSN-21) class submarines and will be forward-fit on Virginia (SSN-774) class submarines. TB-29A will also be used for the SURTASS Twin-line towed array system. It will provide greater capability than the current TB-23 thin-line towed arrays and achieve enhanced supportability through commonality. The TB-29A uses COTS telemetry to reduce significantly unit cost while maintaining superior array performance. These arrays were tested on the SURTASS ships and will begin supporting the IUSS community in FY 2004. Coupled with the submarine A-RCI system, TB-29A arrays are expected to provide the same 400-500 percent increase in detection capability against quiet submerged platforms in blue water and shallow water areas, as the current TB-29 has demonstrated.

**Scaled Improved Performance Sonar**

The Fiscal Year 2006 President's Budget requests $25.5M to procure upgrade kits to modernize the Undersea Warfare (USW) capability on DDG51 Class ships. The Scaled Improved Performance Sonar (SIPS) adjunct upgrade will provide quick, affordable and measurable near term active and passive performance enhancements to the existing AN/SQQ-89 (V) Surface USW Combat System via a ship alteration. SIPS brings to the Fleet improvements in torpedo defense, reduction in false contact rate, and reduced clutter to improve littoral capability, and passive improvements in signal processing and operator displays. The President's Budget request for SIPS builds upon Congressional adds in Fiscal Year 2004 and 2005 for AN/SQQ-89 Modernization and Surface Ship ASW Improvements that have resulted in the successful deployment of SIPS TEMPALTS in the Fleet. The AN/SQQ-89A (V)15 upgrade will integrate into DDG51 Class FLT IIA (DDG79 and onward) ships a new tactical Multi Function Towed Array. It will also provide a commercial off-the-shelf (COTS) based open architecture USW combat system with the capability for mid-frequency bi-static and multi-static sonar operations. The AN/SQQ-89A (V)15 upgrade is also programmed for installation in Baseline III and IV CG-47 Class ships as part of the Cruiser Modernization Program. The AN/SQQ-89A(V)15 production prototype was installed on CG-73 in Fiscal Year 2004.

**Advanced Deployable System**

The Advanced Deployable System (ADS) utilizes an off board distributed sensor field to detect both surface ships and submarines. This capability will be deployed initially from Littoral Combat Ship (LCS) as a component of the LCS littoral ASW capability. Testing of the ADS array performance has been completed and preliminary demonstrations of data transmission have also been completed. This year's efforts focus on initiation of detailed design of the array deployment subsystem, demonstration of array development and continued development and testing of the communications buoy for transmission of array data to the LCS. The program is scheduled to reach Milestone B in September 2005. The fiscal year 2006 budget requests RDT&E to proceed with Systems Development and Demonstration (SDD) phase, with IOC on LCS scheduled for Fiscal Year 2008.

**MK 48 Advanced Capability (ADCAP) Torpedo**

The MK 48 ADCAP torpedo is a wire-guided heavyweight torpedo designed to combat deep-diving nuclear submarines, diesel submarines in the littoral environment, and high-performance surface ships. The torpedo is capable of operating with or without wire-guidance using active or passive acoustic homing. Additionally, it was designed to operate in an acoustic countermeasure environment and has the capability to conduct multiple re-attack procedures. The MK 48 ADCAP torpedo is carried by all attack submarines, by some (4 of 14) of the Ohio class ballistic missile submarines, and will be carried by SSGNs. The MK 48 ADCAP is and will remain the Navy's primary submarine-launched conventional ASW and Anti-surface Warfare torpedo through the year 2026.

The MK 48 ADCAP Torpedo Spiral Development program involves improving torpedo performance through software upgrades primarily against the shallow water diesel threat. Spiral 1 is expected to provide a 25% increase in torpedo effective against targets in shallow water. The MK48 ADCAP Modification program incorporates a new Guidance and Control (G&C) modification and a Torpedo Propulsion Upgrade (TPU) modification to the baseline ADCAP system. The G&C Modification provides a common G&C with the Mod 7 CBASS replacing obsolete electronic components with COTS processors and increased processing capacity. The increased capacity is required for future advanced signal processing techniques that are needed for performance upgrades in shallow water target detection/classification.

The Torpedo Propulsion Upgrade (TPU) addresses the Navy's operational requirement for a quieter ADCAP torpedo. These modifications allow the MK48 ADCAP torpedo to operate effectively in adverse environments, thus enabling the MK48 ADCAP torpedo to counter enemy submarine threats into the 21st century. The Common Broadband Advanced Sonar System (CBASS) program includes a Broadband Sonar Analog Receiver, preamplifier and interfacing hardware providing the capability to transmit and receive over a wide frequency band taking advantage of broadband signal processing techniques. This provides for improvements in advanced threat countermeasures capabilities. The CBASS kits procured in Fiscal Year 2004 through 2007 include Torpedo Propulsion Upgrade (TPU) modification, required for Forebody/Afterbody compatibility with the ADCAP MODs Guidance and Control (G&C) modification. In Fiscal Year 2008, through the remainder of the Mod 7 CBASS program the kits will be installed in Mod 6 MODs Torpedoes, which already contain the TPU upgrade.

The first phase of Spiral 1 has been completed and released for exercise use until completion of operational testing. Full Spiral 1 developmental and operation testing will be completed in FY 06. Spiral 2 development is in progress with DT/OT expected in FY 07. Spiral 3 and 4 are planned for Fiscal Year 2008 and Fiscal Year 2009. The MK 48 ADCAP Mod 6 ACOT

completed DT in November 2004 and will complete OT in February 2005 with IOC expected in July 2005. A total of 388 units are slated for production with the final units delivered in Fiscal Year 2008. The MK 48 ADCAP Mod 7 (CBASS) is in DT with OT scheduled for FY 05 and IOC scheduled for Fiscal Year 2006. A total of 1,263 units are slated for production through the life of the program.

**MK54 Torpedo**

The MK54 air or surface launched torpedo provides an ASW weapon designed to be effective against the diesel-electric submarine threat in the littoral environment. Initial Operating Capability (IOC) for the MK54 torpedo was achieved in August 2004 and represents an improvement in torpedo effectiveness over the legacy MK 46. The Fiscal Year 2006 Budget requests $76M for MK 54 Lightweight Torpedo procurement funds and $32M in RDTE funds. A Pre-Planned Improvement (P3I) program was initiated in Fiscal Year 2005 to integrate the MK 54 with the Vertical Launch ASW Rocket (VLA) and to improve the MK 54's capabilities against emerging threats in challenging mission scenarios through spiral developments. Other planned improvements include a downloader system to support enhanced software builds, insensitive munitions improvements to the warhead, and commonality with the heavyweight torpedo program.

**Surface Ship Torpedo Defense**

The Surface Ship Torpedo Defense (SSTD) encompasses many principles of strategic and integrated ship self-protection and currently provides over 190 surface ships with the AN/SLQ 5A towed countermeasure system capable of defeating a variety of current torpedo threats. The Fiscal Year 2006 Budget provides funding to continue upgrades to the system to enhance system effectiveness against selected future threat torpedoes.

Upgrades to AN/SLQ-25A (NIXIE) incorporate advancements in acoustic technology fused with refinement and expansion of methods used to counter a threat torpedo. These enhancements increase the effectiveness of the system as well as expand its use to the littoral battlespace. Performance upgrades to the NIXIE system, necessary to counter the latest generation of threat torpedoes, are ongoing and are on schedule to be complete in Fiscal Year 2009.

The developing Torpedo Defense System (TDS), AN/WSQ-11, introduces a torpedo detection capability that combines the “softkill” technology of NIXIE with a “hardkill” Anti-Torpedo Torpedo (ATT) countermeasure to engage and destroy threat torpedoes. The goal is to produce a more efficient, automated system that has increased ship survivability effectiveness. TDS is in the midst of a risk reduction demonstration phase to prove the detection, classification, and localization capability of the system. The ATT “hardkill” component of the system is progressing in parallel. These efforts will culminate in a series of in-water demonstrations in Fiscal Year 2006. Additionally, TDS is being developed to provide a robust torpedo defense against all threat torpedoes employing a combination of passive and active acoustic detection that will reliably detect, classify, and localize incoming torpedoes as well as salvos of torpedoes.

**VIRGINIA (SSN 774) Class Attack Submarine**

With its Operational Requirements Document (ORD) approved in 1993, the VIRGINIA (SSN 774) Class nuclear-powered attack submarine is the first major combatant designed to meet the threats of the post-Cold War environment. It is designed to operate across a broad spectrum of regional and littoral missions as well as open-ocean, "blue water" operations. Land, sea, and undersea firepower, advanced sensors, and other special features will enable Virginia to execute numerous warfighting tasks in support of the CNO's SEAPOWER 21 objectives.

The VIRGINIA Class will be able to sustain high-tempo operations for extended periods of time without the need for forward-based logistic support, and be able to surge to remote and distant locations at a sustained high speed.

The VIRGINIA Class will be capable of supporting a wide spectrum of special warfare requirements. It is equipped with a swimmer lockout trunk and is capable of carrying the Advanced SEAL Delivery System (ASDS) or Dry Deck Shelter (DDS) for Special Operations Forces (SOF) support. The VIRGINIA Class will also have a reconfigurable torpedo room to support a large number of SOF personnel or to accommodate other special missions.

The VIRGINIA Class will be able to conduct clandestine precision strike and support of forces ashore, launching land-attack missile salvos without warning.

The VIRGINIA Class will have SEAWOLF-level of acoustic stealth and an improved non-acoustic stealth capability, ensuring the U.S. can gain and sustain access to contested and otherwise politically denied areas. The inherent stealth of the VIRGINIA Class submarine, combined with its heavyweight torpedoes and advanced towed and hull-mounted sensors, will enable it to control sea lanes and dominate the littoral battle space.

The VIRGINIA Class will be better connected to the Fleet than any submarine class in history with a state-of-the-art communications system. Its combat suite will employ a high bandwidth information backbone that integrates the common operational picture with internal sensors, weapons, and links to the carrier strike group using a common submarine radio room, a multi-channel wideband communications suite, and a high-data-rate antenna.

Exploiting assured access to contested areas, VIRGINIA Class submarines will develop and share dominant knowledge that only a submarine can get, providing combatant commanders with unique, long-term insights into a potential adversary's capabilities, tactics, and operating patterns, whether a country or a terrorist group. They will also provide real-time, actionable intelligence.

The open systems architecture design of the VIRGINIA Class electronics allows the submarine to be reconfigured for a variety of missions and accommodates easy technology upgrades.

The Fiscal Year 2006 Budget request includes $2.4B for the eighth ship, advance procurement for the ninth and tenth ships of the VIRGINIA Class, and Economic Order Quantity (EOQ) material procurement for the ninth and tenth VIRGINIA Class submarines. There are a total of ten VIRGINIA Class submarines under contract. This year's ship will be the third ship in the five-ship Multi Year Procurement (MYP). This MYP contracting approach provides the Navy savings of $80M per ship for a total savings of $400M compared to "block buy" procurement. These ships currently continue to be built under the teaming approach adopted by Congress in 1998, which maintains two capable nuclear submarine shipbuilders at a cost to the Department.

**MH-60R and MH-60S**

The Fiscal Year 2006 Budget requests $655.5M in procurement and $48.1M in RDT&E for the replacement of the Light Airborne Multi-Purpose System (LAMPS) MK III SH-60B and carrier-based SH-60F helicopters with the new configuration designated as MH-60R. The procurement quantity was reduced to provide an orderly production ramp. A Full Rate Production decision is scheduled during the second quarter of Fiscal Year 2006. The Fiscal Year 2006 Budget requests $632.2M in procurement and $78.6M in RDT&E funds for the MH-60S, which is the Navy's primary combat support helicopter designed to support Carrier and Expeditionary Strike Groups. It will replace four legacy platforms with a newly manufactured H-60 airframe. The MH-60S is currently in the full rate five-year MYP contract with the Army. The Army and Navy intend to execute another platform MYP contract commencing in Fiscal Year 2007.

**Multi-mission Maritime Aircraft (MMA)/P-3C**

The future for the Navy's maritime patrol force includes plans for sustainment, modernization, and re-capitalization of the force. Results of the P-3 Service Life Assessment Program (SLAP) have revealed the need for an aggressive approach to P-3 airframe sustainment. Key elements of the sustainment plan are strict management of requirements and flight hour use, special structural inspections to keep the aircraft safely flying, and increased use of simulators to satisfy training requirements. The Fiscal Year 2006 Budget request reflects $74.5M for Special Structural Inspections (SSI) and Special Structural Inspections - Kits (SSI-K), which will allow for sustainment and continued operation of approximately 166 aircraft. As the sustainment plan progresses, the inventory may be further reduced to a number approaching 130 aircraft. The Fiscal Year 2006 Budget request also reflects a modernization budget of $51.3M for continued procurement and installation of the USQ-78B acoustic processor and for completion of final installations of Anti-Surface Warfare Improvement Program kits. We are working on plans for further mission system modernization to allow us to continue meeting COCOM requirements. To recapitalize these critical aircraft, the Navy is procuring a MMA. The MMA program entered System Development and Demonstration (SDD) phase in May 2004 and awarded a contract to the Boeing Corporation for a 737 commercial derivative aircraft. The Fiscal Year 2006 Budget requests $964.1M for continuation of MMA SDD. Our comprehensive and balanced approach has allowed for re-capitalization of these critical assets.

**Broad Area Maritime Surveillance**

Broad Area Maritime Surveillance (BAMS) is being designed to support persistent, worldwide access through multi-sensor, maritime Intelligence, Surveillance and Reconnaissance (ISR) providing unmatched awareness of the maritime battlespace. This forward deployed, land based, remotely operated and unarmed system will feed the maritime Common Operational Picture and is planned as a Fleet Response Plan enabler as a trip wire for surge forces. BAMS enables FORCEnet decision superiority precision and mobility and operates independently or in direct collaboration with other assets. BAMS is a key system, along with the MMA and Aerial Common Sensor, in the recapitalization of the Navy's airborne ISR fleet.

**Littoral Combat Ship**

LCS will be built from the keel up to be a part of a netted and distributed force. The key war fighting capability of LCS will be its off-board systems: manned helicopters and unmanned aerial, surface and underwater vehicles. It is the off-board vehicles -- with both sensors and

weapons – that will enter the highest threat areas. Its modular design, built to open-systems architecture standards, provides flexibility and a means to rapidly reconfigure mission modules and payloads. Approximately 40% of LCS's payload volume will be reconfigurable. As technology matures, the Navy will not have to buy a new LCS sea frame, but will upgrade the mission modules or the unmanned systems. The program provides the best balance of risk with affordability and speed of construction. We have partnered with the US Coast Guard to look for commonalities with USCG cutters. Additionally, there are several nations interested in purchasing the sea frame.

Two contracts were competitively awarded in May 2004, for final design of two different LCS Flight 0 sea frames. Flight 0 is comprised of four ships that will develop and demonstrate several new approaches to naval warfare including suitability of large-scale modular mission technologies and new operational concepts in the littoral. The detail design and construction of the first LCS flight 0 ship began in Fiscal Year 2005. To date, all milestones have been met on schedule. Final design for the second ship is ongoing with detail design and construction starting in fiscal year 2006. The two remaining sea frames for LCS Flight 0 will be requested in fiscal year 2007. The LCS spiral development acquisition strategy will support construction of multiple flights of focused mission ships and mission packages with progressive capability improvements.

Procurement of the three mission packages (ASW, Mine Countermeasures (MCM), and Surface Warfare (SUW)) is planned in Fiscal Year 2006. The mission packages allow the Joint Force Commander the flexibility to tailor LCS to a specific focused mission based on threat, maximizing war-fighting capability. The MCM mission package will detect, classify, identify, and neutralize a suspected mined region. The ASW mission package will detect, identify, track, and engage quiet diesel submarines. The SUW mission package will detect, identify, track, and engage the small boat threat. Mission packages are comprised of scaleable sensors and systems capable of sending data to a netted force. Off-board vehicles are inherent to the mission packages to provide transport for sensors, weapons, and systems. The use of unmanned off board systems allows the Navy to sense or engage a threat over the horizon and keep the Sailor out of harms way. The Department is well positioned to proceed with LCS and deliver this needed capability to Sailors as quickly as possible.

# MINE COUNTERMEASURES

The Fiscal Year 2006 U.S. Naval Mine Countermeasures (MCM) Plan was certified on February 25, 2005, by the Department of Defense (DoD) staff in compliance with Public Law 102-190 (as modified), detailing Department of the Navy (DON) intent regarding mine countermeasures programs and compliance with DoD direction. The purpose of the annual Naval MCM Plan is to describe the program that will field technologies to improve mine countermeasures throughout the Future Years Defense Program (FYDP).

Building upon the vision outlined in the Fiscal Year 2005 MCM Certification Plan, this year's plan includes a roadmap depicting evolution of mine warfare systems adopting technology that is necessary to "field a common set of unmanned, modular MCM systems employable from a variety of host platforms or shore sites that can quickly counter the spectrum of mines to enable assured access with minimum risk from mines." This roadmap describes the direction the Navy intends to pursue for mine warfare both within the FYDP and beyond. The technologies and capabilities identified for development were included in Sea Shield analysis in order to validate investment options that will fill critical capability gaps. Continued development of sensors is necessary to expand current capacity, fill capability gaps, and shorten MCM timelines through improved detection and identification of mines.

The Navy has begun an effort to deliver an overarching MCM Initial Capabilities Document (ICD) for review by the Joint Staff through the Joint Capabilities Integration and Development System (JCIDS). The Mine Warfare mission area is an essential capability in the Joint Forcible Entry Operations (JFEO) and Joint Undersea Superiority Study initiatives.

We are committed to maintaining the required MCM force to ensure that the U.S. possesses a viable MCM capability to support overseas operations and provide for Homeland Defense.

**Organic Mine Countermeasures (OMCM)**

OMCM is being designed to be fully compatible with and supportive of Strike Group operations and maneuver. Strike Group commanders will possess a full range of OMCM capabilities to immediately commence MCM operations, minimizing operational delay and impact of the mine threat to a strike group's ability to maneuver in support of the mission.

Initially envisioned as mainly an aircraft carrier based capability with assets spread throughout the strike group, our organic plan has evolved to a more flexible and responsive Littoral Combat Ship MCM Mission Package concept. In reassessing our Organic MCM fielding plan, we programmed funding for Fiscal Year 2006 based on modular and flexible Mission Package systems to be employed by LCS or a multi-mission type platform of opportunity. The objective is to field OMCM systems as available to the Strike Groups to provide an embedded MCM capability. Supplementary capability, from dedicated forces and MCM deployed LCS MIW Mission Packages, will be available to augment a deployed organic capability to meet combatant commander requirements.

Several significant acquisition issues impacted our Organic MCM plan this past year. Technical development issues in programs and integration challenges with the MH-60S and the Organic Airborne MCM systems forced us to restructure several programs. These challenges have caused a delay in achieving the planned initial OMCM 2005 deployment. The Navy plans to

field the organic capability as systems are developed under the new schedule to LCS Mission Packages commencing in Fiscal Year 2007. It remains our goal to field a robust Organic MCM capability on LCS. With the Remote Mine-hunting system (RMS) on DDGs, LCS, and MIW Mission Package fielding, we will have increasing numbers of Organic MCM assets available to support Strike Groups with the needed MIW capability beginning in 2007. Rapid fielding of LCS in numbers is critical to the Navy satisfying its organic mine detection and neutralization requirements as stated in the current Mine Certification Plan.

The Fiscal Year 2006 President's Budget requests RDT&E and procurement funding for a variety of organic mine countermeasure systems, several of which will be employed by the MH-60S helicopter as an organic capability within the Navy's strike groups.

**Advanced Mine Hunting Sonar**

The AN/AQS-20A Advanced Mine Hunting Sonar is a single pass multi-sonar system designed to detect, classify, localize and identify mines on the sea floor and in the volume. The FY2006 President's Budget requests$3.4M for the AN/AQS-20A to complete developmental testing, operational testing, and award a contract for six AN/AQS-20A systems. We have completed system developmental testing on the MH-53E to support a Milestone C decision in April of 2005. IOC for the AN/AQS-20A is scheduled for 2007.

**Airborne Mine Neutralization System**

The Airborne Mine Neutralization System is a lightweight expendable mine neutralization system is an MH-60S weapon system designed for rapid neutralization of bottom and moored mines. The FY2006 President's Budget requests $7.7M to complete contractor testing, system developmental testing, and leading to Milestone C and low rate initial production (LRIP) in Fiscal Year 2007. IOC is scheduled for 2008.

**Airborne Laser Mine Detection System**

The AN/AES-1 Airborne Laser Mine Detection System (ALMDS) is an MH-60S sensor designed to detect moored, near surface mines using light detection and ranging technology mines. The FY2006 President's Budget requests $5.9M in OPN for two maintenance and fault emulation trainers in addition to the three LRIP units purchased in Fiscal Years 2005. System developmental testing is nearing completion in support of a Milestone C decision scheduled for May 2005. IOC is scheduled for 2008.

**Rapid Airborne Mine Clearance System**

The AN/AWS-2 Rapid Airborne Mine Clearance System (RAMICS) is being developed to counter by destruction of near surface and floating mines using a 30mm cannon hydro-ballistic projectile and includes a target reacquisition pod co-located on the MH-60S. The FY2006 President's Budget requests $16.2M to complete design, perform contractor testing, and begin developmental testing. IOC is scheduled for 2010.

**Organic Airborne and Surface Influence Sweep**

The Organic Airborne and Surface Influence Sweep (OASIS) System will ensure the Navy will maintain an assured access capability and counter influence mines that may not be found using other mine hunting systems. OASIS is a lightweight magnetic/acoustic influence sweep system

employed by the MH-60S. The FY2006 President's Budget requests $13.9M for the completion of developmental and operational testing leading to Milestone C and LRIP in Fiscal Year 2007. IOC is scheduled for 2008.

**Remote Mine Hunting System**

The Remote Mine Hunting System (RMS) is being developed as an unmanned semi-submersible vehicle to deploy from both the DDG-51 Class (DDG 91-96) and the LCS. This system will provide an over-the-horizon organic mine hunting capability to ensure our combatants stay free of mine danger areas. The RMS includes the AN/AQS-20A mine hunting sonar as its initial and primary sensor. We are also exploring the multi-mission potential of the RMS vehicle (which is the Remote Mine-hunting Vehicle (RMV)) as one of the systems for our LCS, ASW mission module package. The Fiscal Year 2006 President's Budget request for OPN for RMS is $55.3M for four RMS systems and $34.2M for RMV ASW mission package (four vehicles). RMS is undergoing developmental testing in preparation for Milestone C scheduled in June 2005. IOC is scheduled for 2007.

**Mission Reconfigurable Unmanned Undersea Vehicle**

The Mission Reconfigurable Unmanned Undersea Vehicle (MRUUV) is an autonomous vehicle that will launch and recover from Los Angeles and Virginia class submarines, be LCS and SSGN compatible, and provide more than forty hours of autonomous endurance. MRUUV will perform clandestine minefield reconnaissance, deliver a clandestine intelligence preparation of the battlespace capability and will be reconfigurable to conduct visual and electromagnetic Intelligence/Surveillance/ Reconnaissance missions. MCM capabilities will include bottom mapping for change detection and mine localization and classification. The FY2006 President's Budget requests $54.6M RDT&E in FY06 for continuing development of this vehicle. IOC is scheduled for 2011.

**Assault Breaching System**

Assault Breaching System (ABS) is a system of systems to provide full mine and obstacle countermeasures capability for Ship to Objective Maneuver (STOM) in the surf and beach zones. It includes: Countermine/Counter Obstacle, ISR/Targeting, Precision Navigation, Lane Marking and C4I. Several program milestones were achieved in 2004 with successful static and dynamic testing of the munitions showing success against surface laid mines and obstacles in the surf zone and beach zone. The Navy and the Air Force also signed a Memorandum of Agreement for Air Force delivery of assault breaching munitions in 2004. The FY2006 President's budget requests $29.3M in RDT&E to continue research, development and testing and $2.3M in OPN to procure precision navigation systems. The Navy expects to have an interim capability for assault breaching using in-service munitions by FY07 and the advanced warhead system reaches IOC in FY14.

**Improving Existing Capabilities**

Dedicated Surface Mine Countermeasures (SMCM): The FY2006 President's Budget requests $22.1M in RDT&E to perform upgrades to the SQQ-32 Variable Depth Minehunting Sonar to High Frequency Broadband and continue development of the Expendable Mine Neutralization System. The FY2006 budget also requests $30.5M in OPN to facilitate combat system upgrades throughout the MCM-1 Avenger class to include improved navigation, communications, self-powered acoustic generators, SQQ-32 common winch modernization, battlespace profiler

improvements, and an accelerated Global Command and Control System/Mine Warfare Environmental Decision Aids Library modernization.

The FY2006 President's Budget requests $12.1M in OMN to fund MCM-1 Class hull, mechanical, and engineering improvements. Ship depot maintenance is also being addressed with a request for $57.3M to fund depot level maintenance for all active and reserve MCM ships.

Dedicated Airborne Mine Countermeasures (AMCM): The FY2006 President's Budget requests $20M in OMN to provide support/maintenance/overhauls of dedicated in-service AMCM systems and $3.7M in OPN to fund modernization of dedicated in-service AMCM systems via approved Engineering Change Proposals (ECP). ECP's are analyzed, validated, prioritized, and approved to accommodate replacement of weapon system components due to operational upgrade requirements and obsolescence.

## SHIP SELF-DEFENSE

The Navy and Marine Corps Team takes a very broad view of what constitutes ship self-defense. Each unit is an integral component and critical node in the Force shaped by Sea Power 21. The defense of our netted and distributed force must consider any threat to our ability to assure access to our desired maneuver space as credible and real. The threats in this arena vary from very high end ballistic and cruise missiles to low tech weapons fielded by determined adversaries. We must invest appropriately across this spectrum to ensure access.

### Theater Air and Missile Defense

Anti-ship cruise missiles and ballistic missiles constitute an anti-access challenge to our joint forces today. In the near future, more advanced threats like cruise missiles with very low radar cross sections and hypersonic speeds, as well as ballistic missiles with maneuvering reentry vehicles, will intensify this challenge and also hazard ships at sea. Navy is closely collaborating with the services, the Combatant Commanders, and the Missile Defense Agency to ensure that the relative sanctuary of the maritime domain is maintained in the face of an escalating threat. Moreover, we are developing capabilities that will extend a defensive umbrella over our joint forces fighting ashore.

If the joint force is to prevail in the Theater Air and Missile Defense (TAMD) battle, it must be a netted force. Key to this concept is an integrated fire control architecture comprised of sensors and weapons that can effectively carry our defenses to the sea-land interface and beyond. Navy Integrated Fire Control Counter-air (NIFC-CA) is the embodiment of this strategy in the current program. The marriage of the SM-6 active missile, the Advanced Hawkeye elevated sensor, and the Cooperative Engagement Capability (CEC) will enable our ships to interdict cruise missiles and manned aircraft deep over land, a mission that currently diverts a large number of carrier aircraft sorties from the principal task of strike warfare. NIFC-CA will be the means by which we extend the Sea Shield beyond the water's edge.

Conceptually, the TAMD battle will be a joint fight—the threat battery arrayed against us demands the best efforts of all services acting together to prevail. Our analysis has also convinced us that we have to leverage a variety of mission means to get this job done properly. Information Operations, Electronic Attack, Computer Network Attack, as well as joint active defenses, must be blended together in a strategy that neutralizes the enemy order of battle. Navy is currently collaborating with the Missile Defense Agency to both bolster our nascent ballistic missile defense system and develop the new capabilities that will be required to pace the advancing threat. Navy destroyers have been equipped with ballistic missile defense tracking capability and are operating in the Sea of Japan as part of the homeland defense architecture against ICBMs. Six Aegis equipped DDGs have been modified thus far and will grow to 15 by 2006. Additionally, the SM-3 missile development by MDA has been notably successful. Since 2002, Navy crews aboard the cruiser LAKE ERIE are "5 for 6" on the test range. Following the most recent target hit on February 24, 2005, we have a proven operational computer program and four SM-3 missiles on hand in Hawaii—a deployable engagement capability should the nation require it. Eighteen Aegis equipped ships will be fitted with ballistic missile engagement capability in the next few years and the inventory of SM-3 missiles will steadily grow to over 100 in the same timeframe.

Our allies are keenly interested in TAMD as well. Japan has been engaged in cooperative research and development with us since 1999; next year a Japanese destroyer will fire an

improved SM-3 missile that has been developed jointly in this process. Japan is also buying SM-3 missiles and will equip each of their four Aegis equipped destroyers with eight of these weapons over the next four years. Additionally, MDA and Japan are now pursuing a greatly improved and more energetic version of the SM-3. This development features a 50-50 cost share, a clear demonstration of Japan's commitment in this regard. Australia, United Kingdom, Spain, the Netherlands, and South Korea are also actively engaged and collaborating in the TAMD arena.

Navy investment of over a billion dollars in missile and sensor development is the linchpin of our ongoing effort to develop effective ballistic missile defenses that operate within the earth's sensible atmosphere. Our analysis shows that a layered defense comprised of SM-3 missiles in space and a sea-based terminal missile defense (SBT) will be necessary to ensure that our joint forces are secure at sea and can effectively move ashore in the face of advanced ballistic missile threats. The Army's PATRIOT and THAAD developments provide a land-based terminal defense, but we are missing the terminal layer at sea. MDA and Navy are currently working together to develop the most sensible alternatives for SBT and are resolved to develop a mutually agreed acquisition strategy by this summer.

**Cooperative Engagement Capability (CEC)**

The Fiscal Year 2006 President's Budget requests $88.1M for continued development of the Navy's CEC. CEC provides a significant step forward in transforming our situational awareness of the battlespace. CEC's successful completion of OPEVAL allows implementation of this capability within the fleet and is a major step in developing a network-centric force. The CEC program has been restructured to achieve alignment with the Navy's OA plans as well as to meet forthcoming requirements from the Joint Single Integrated Air Picture Systems Engineering Organization (JSSEO). A revised acquisition strategy reflecting this restructured approach was approved August 18, 2004. This revision included the implementation of a pre-planned product improvement (P3I) approach to modify the current equipment to meet reduced size, weight, cost power and cooling objectives. The P3I approach will also implement the existing Navy design objective with regard to open systems, interoperability and program protection. By the end of Fiscal Year 2006 a total of 40 ships and five E-2C Hawkeye 2000 squadrons will be equipped with CEC. The Fiscal Year 2006 Budget request $40.3 million to procure five additional CEC systems. The acquisition strategy also outlines the implementation of a single-track management solution set for Navy systems that will incorporate the integrated architecture behavior model from JSSEO. This will maximize the potential for Joint interoperability across the battlespace. We are currently in the process of competitively selecting a System Integrator/Design Agent to implement the developed track management solution set across the Fleet. CEC significantly improves our Battle Force defense in depth, including both local area and ship defense capabilities against current and future AAW threats. Moreover, CEC provides critical connectivity with and integration of over-land defense systems capable of countering emerging air threats, including land attack cruise missiles, in a complex littoral environment.

**E-2C and Advanced Hawkeye**

The E-2C Advanced Hawkeye (AHE) is a critical enabler of transformational intelligence, surveillance and reconnaissance, providing a robust overland capability against current and future cruise missile-type targets. The AHE program will modernize the E-2 platform by replacing the current radar and other system components to maintain open ocean capability while adding transformational surveillance as well as theater air and missile defense capabilities. The

Fiscal Year 2006 Budget requests $249M to procure two TE-2Cs in the third year of a four-year MYP. This effort will keep the production line viable while the AHE, formerly known as the Radar Modernization Program, continues spiral development toward an Initial Operational Capability in Fiscal Year 2011. The AHE program continues to execute the program of record. Further, OA standards are being integrated into E-2C aircraft and AHE program to enhance interoperability with DoD systems.

**Ship Self-Defense System (SSDS)**

The Fiscal Year 2006 President's Budget requests $40.5M to complete the Follow-On Test and Evaluation (FOT&E) in USS SAN ANTONIO (LPD 17) and begin live fire testing in the SDTS. The SSDS is designed to expedite the detect-through-engage process for amphibious ships and aircraft carriers against anti-ship cruise missiles (ASCMs). SSDS consists of a combination of software and commercial off-the-shelf hardware intended to integrate sensor and engagement systems. Progress during Fiscal Year 2004 focused on the industry formal qualification tests of the SSDS MK 2 system and the delivery and test of the system in USS REAGAN, CVN 76. SSDS MK2 is implementing open architecture to enable sharing of common command systems applications across the surface fleet.

**Standard Missile**

The Fiscal Year 2006 President's Budget requests $121M for Standard Missile-6 (SM-6). SM-6, the Extended Range Active Missile, provides a transformational enabler to the U.S. Navy revolutionizing naval warfare. Combining an AMRAAM active seeker onto the proven Standard Missile airframe, SM-6 provides an extended range anti-air warfare capability both over sea and over land. This low-risk approach relying on Non-Developmental Items will support a Fiscal Year 2010 IOC. With integrated fire control, SM-6 will provide the surface Navy increased battlespace against AAW threats over-the-horizon, taking full advantage of the kinematics available in Standard Missile. SM-6 was designated an ACAT 1D program after completing a Milestone B Decision Meeting on June 15, 2004. Three months later, a System Development and Demonstration contract with cost and technical/schedule performance incentives was successfully awarded. Low Rate Initial Production is scheduled for Fiscal Year 2009.

**Evolved Sea Sparrow Missile (ESSM)**

The ESSM is a kinematic and extended range all weather upgrade to the RIM-7 Sea Sparrow missile which provides self-protection for surface ships against current and future anti-ship cruise missile threats. It was developed to balance total system effectiveness and extend the battle space against the low-altitude and supersonic ASCM threat. ESSM is an international cooperative development and production effort that includes 10 participating governments. By the end of Fiscal Year 2005, ESSM will be in service in six of the 10 participating governments including the U.S. The Fiscal Year 2006 President's Budget requests $99.8M to procure 116 missiles.

**Rolling Airframe Missile (RAM)**

The RAM program provides surface ships with a low-cost, lightweight, self-defense system with which to defeat ASCMs. The United States and the Federal Republic of Germany jointly developed and support RAM. Combined Developmental Test/Operational Test (DT/OT) began in June 2003, and extended into Fiscal Year 2004, using the existing SDTS to ensure

operationally realistic tests for determining that RAM with the new helicopter-air-surface software retained capability against ASCMs and to carry out follow-on testing from the Fiscal Year 1999 operational evaluation. The Fiscal Year 2006 President's Budget requests $86.9M to procure 90 Block 1 missiles and 200 ordnance alteration kits. Risk reduction efforts commenced in Fiscal Year 2005 for the spiral development kinematic upgrade of the RAM missile with the intention of beginning System Development and Demonstration in Fiscal Year 2006.

**AIM-9X**

This program is an integral part of the netted force defensive counter air capability. The Fiscal Year 2006 Budget requests $ 37.8M for 165 missiles. A major modification to the AIM-9M Sidewinder, the AIM-9X is a joint USN/USAF program that upgrades the missile with a staring focal plane array in the seeker, an extremely agile airframe, and state of the art signal processors resulting in enhanced target acquisition, missile kinematics, and improved infrared counter-countermeasures capabilities. When coupled with the Joint Helmet-Mounted Cueing System, the Sidewinder's high off-boresight capability will revolutionize the way these air-to-air missiles are employed. AIM-9X continues deployment to operational sites after a successful Full Rate Production decision last year. AIM-9X continues deployment to operational sites after a successful Full Rate Production decision last year.

**AMRAAM**

AMRAAM is also a critical weapon system for ship and force defense in the netted force. The Fiscal Year 2006 Budget requests $81.5M for 101 missiles. Fiscal Year 2006 begins the first year of procurement for the new Phase 4 AMRAAM. Continued procurement of the joint AMRAAM, with a P3I Phase 4 contract, will provide significant network-centric warfare capability, enhanced GPS guidance, improved high-off-boresight capability, electronic protection and missile kinematics. Phase 4 AMRAAM is scheduled to IOC in Fiscal Year 2008.

**Close-In Weapons System (CIWS)**

An evolutionary upgrade to the Phalanx line, CIWS 1B continues to provide terminal self-defense against the full spectrum of ASCM threats and high speed aircraft with the significant addition of a lethal day/night Helicopter-Aircraft-Surface (HAS) capability against small, high speed, maneuverable surface threats and low, slow air threats. CIWS 1B delivers significant capability to the Fleet to help us in anti-terrorism force-protection (AT/FP) the GWOT. Through the Fiscal Year 2005, 34 CIWS 1B installations will be completed. The Fiscal Year 2006 President's Budget requests $195.6M to procure 43 1B upgrade and conversions and 24 Shipboard Installations. In total, the program supports CIWS 1B installation on 146 U.S. Navy ships and will be complete by Fiscal Year 2012.

The Army is exploring using CIWS, as a potential counter-rocket, artillery and mortar capability (C-RAM) in support of Operation Iraqi Freedom. A limited deployment of C-RAM capability has been directed. The Navy will provide 6 to 12 CIWS 1B technicians and two CIWS mounts (already procured w/Army funds) in support of this deployment. A highly successful demonstration of CIWS capability against mortar attacks was conducted in Yuma, AZ on December 14, 2004. The demonstration was observed by GEN Abizaid and led to decision to pursue rapid acquisition of CIWS for C-RAM.

**Self Defense Test Ship (SDTS)**

Range safety issues prevent live fire testing of ship self defense systems involving manned civilian or Fleet assets. The SDTS is a ship that is unmanned and remotely controlled for safe live-fire testing of ship self defense systems inside the safety region. These tests are not allowed against a manned ship due to range safety limitations. The SDTS provides essential combat system and element level testing in an at-sea environment, close in, against representative targets. Since becoming operational in October 1994, the ex-USS DECATUR has tested systems such as Rolling Airframe Missile Block 1, Close-In Weapon System Block 1A and 1B, Ship Self Defense System, NATO Seasparrow Missile System, and the Evolved Sea Sparrow Missile. The schedule and cost savings of commissioned warship time and manpower has been substantial to date. Recently, the ex-USS DECATUR was replaced by ex-USS PAUL F. FOSTER as the Self Defense Test Ship Replacement (SDTS-R). The SDTS-R is currently under conversion and will be available for testing in the 2nd quarter of Fiscal Year 2006. The Fiscal Year 2006 President's Budget requests $7.1M to support the SDTS-R to provide the Navy with an unmanned, at-sea self defense weapons test and evaluation platform. However, even this investment in SDTS-R will not allow us to conduct live fire testing of every weapon system in all situations due to safety and cost considerations. We continue to improve the fidelity of our modeling and simulation capability so we can validate system performance under a wide range of conditions.

## Task Force Hip Pocket

Task Force (TF) Hip Pocket was established in 2002 to address the vulnerabilities exploited in the attack on USS COLE (DDG 67). The early TF Hip Pocket initiatives were intended to be fast, inexpensive gap-fillers while more effective measures were developed and fielded. Phase I of TF Hip Pocket delivered more, and more robust, small arms to each surface ship. We have delivered 90 Mk44 GAU-17 Gatling Guns and 390 Mk95 Twin .50 cal machine gun mounts. Phase II of TF Hip Pocket was initiated in parallel with Phase I and is intended to improve existing self-defense system performance. The Mk38 gyro-stabilized 25mm chain gun, scheduled for at-sea testing in March 2005 will provide increased small arms effectiveness against inbound small craft. Our Fiscal Year 2006 budget includes $76.3M for 113 25mm chain guns. Additionally, we developed the 5 inch Force Protection "BB" rounds which has a greater effective area and adds significant capability against high-speed small craft. Over 6,000 rounds have been delivered and will be deployed to the fleet this year.

### Shipboard Protection System

Phase III of TF Hip Pocket was intended to increase situational awareness and included non-lethal self-protection measures for determining intent. To improve situational awareness the Navy developed IROS3, an Integrated Radar Optical Sighting and Surveillance System (IROS3). IROS3 was a concept demonstration developed to defend U.S. Navy ships against COLE-type attacks whether in port, anchored, or transiting restricted choke points. Incorporating the lessons learned from the IROS3 demonstration, the Shipboard Protection System (SPS) program of record was established for Fiscal Year 2005. SPS will be employed as a force protection, 360-degree situational awareness tool for determining hostile intent and conducting non-lethal and lethal engagements. SPS complements ship's self-defense weapons including the existing small arms and the Phalanx Close-in Weapons System (CIWS) Block 1B. CIWS-1B provides protection against swarming, high speed, maneuverable surface threats at ranges out to 4000 yards and Air Defense capability against ASCM, low, slow flyer air threats (helicopter, "Cessna" type aircraft). The Navy plans to purchase 124 systems with incremental, increasing protection capability across the Fiscal Year 2005-2009 at a cost of $374M.

**Stabilized 25mm Chain Gun**

The stabilized 25mm chain gun improves a ship's layered self-defense capability against the asymmetric small boat threat underway, in restricted waters, and in port. The modification upgrades the current 25mm minor caliber chain gun with stabilization, remote operation, fire control and an Electro-Optical/InfraRed (EO/IR) device with a laser rangefinder. The mount also features an embedded trainer to improve watchstander proficiency without firing live ammunition.

Land-based and at-sea demonstrations in 2003 refined the stabilized gun requirements. A Fiscal Year 2004 demonstration validated the dramatic improvement over the unstabilized guns from the standpoint of accuracy and use in determining intent of unknown contacts. The first stabilized mount has been installed in USS PRINCETON (CG 59) for shipboard testing. The system will IOC this summer and will likely deploy in USS LAKE CHAMPLAIN (CG 57). Current fielding plan will focus on cruisers, amphibious landing ships (LSDs), and destroyers (DDGs) with priority going to deploying ships. Program of record funds 139 systems.

The important thing to note about this program is that the timeline from inception to installation in a surface combatant occurred in 24 months.

**5-inch Kinetic Energy Projectile (KE-ET)**

The KE-ET round development effort was initiated in Fall 2002 to provide increased Surface Warfare capabilities against asymmetric threats. The project was an accelerated product improvement that made use of components from our 5" ammo programs to field a round commonly called the "BB" round that could be fired down a bearing at incoming small boats. The round gets its name from the 9000 tungsten pellets that are packed into a cargo projectile body. The round has demonstrated a dramatic increase in the lethality against troops and light boats over the legacy 5" rounds. Shipboard testing and demonstration was conducted in June 2003 and further demonstrated the accuracy and lethality of the round. It was confirmed that the BB round doubled the area of lethality against the small threat. The demonstration was successful enough for the Navy to initiate the modifications necessary to fire this round from all the different 5" gun configurations, including the 5"/62, Mod 4 guns that are in the new DDG ships.

Production was completed in December 2004, and we expect to see the BB round in action with an upcoming deployment in 3rd Quarter Fiscal Year 2005. This is another example of rapidly fielding enhanced capability to the Fleet.

**5-inch High Explosive Projectile (HE-ET)**

HE-ET rounds capitalize on the improved performance characteristics of the Electronically Timed (ET) fuse attached to a High Explosive (HE) projectile body. These rounds are easily converted from the aging controlled variable timed projectiles HE-CVT by adding the ET fuse. Currently, there are 4000 HE-ET rounds in inventory and there is funding to convert several thousand more. The 5" gun system is able to place projectiles accurately in the vicinity of the target, but the aging HE-CVT projectiles are unreliable. The improved rounds (both KE and HE

with electronically timed fuses) have consistently demonstrated reliable air bursts above surface targets for a much more lethal effect against small boats.

**Surface Ship Torpedo Defense (SSTD)**

As previously discussed in the Anti-Submarine Warfare Section.

**Surface Ship Modernization in support of Sea Shield Capabilities**

We are making a concerted effort to develop agile and configurable systems that will deliver the capabilities necessary to ensure success and provide offensive firepower for the netted Sea Power 21 force. To bridge the gap from legacy capabilities to future capabilities, we must modernize our ships to be compatible with the rapidly developing critical enablers and to improve their self-defense systems to ensure they will be able to operate in the Littoral. OA is key to upgrading the computer architecture of the CGs and DDGs to allow rapid capability enhancements similar to the submarine acoustic required commercial off the shelf insertion program.

**TICONDEROGA (CG 47) Cruiser Modernization Plan**

Last year, Congress did not approve the $179M request for modernization of the TICONDEROGA Class cruisers and rescinded $56M of unobligated prior year funding. The CG Modernization program has been restructured in Fiscal Year 2006, in accordance with Congressional direction. Under the restructured plan, the older Baseline 2 and 3 ships will be modernized first. Funding begins in Fiscal Year 2006 for long lead-time procurements for a Fiscal Year 2008 Baseline 2 modernization availability of USS BUNKER HILL (CG 52). The Navy's plan will substantially increase the service life and capability of those CG 47 Class ships equipped with the Vertical Launch System. This modernization will reduce combat system and computer maintenance costs, replace obsolete combat systems, and extend mission relevance and service life. It will also incorporate manpower improvements and quality of service enhancements from the Smart-Ship program.

**DDG Modernization**

Using the lessons learned from the cruiser modernization process, we are planning the process for modernizing DDG now. The Fiscal Year 2006 Budget request includes $29M across several appropriations to begin the process to bring needed mid-life DDG modernization enhancements to the mainstay of our surface fleet. DDG 51 is scheduled to be the first legacy destroyer to receive the modernization upgrade in Fiscal Year 2010.

**FFG Modernization**

The Fiscal Year 2006 Budget supports modernizing the FFG -7 Class ships under the SHIPMAIN process. The Modernization program corrects the most significant class maintenance and obsolescence issues in order to maintain the ships through their full 30-year service life. Major hull, mechanical, and engineering upgrades include the replacement the four obsolete Ship's Service Diesel Generators, and improved boat davit, firefighting systems, and combat system power generation. Combat Systems improvements include installation of CIWS-1B and NULKA. All 30 ships will be modernized by Fiscal Year 1010.

## Unmanned Aerial Vehicles (UAV)

We are just beginning to understand the true capabilities resident in unmanned vehicles. These systems remove humans from harms way while providing the warfare commanders distributed, netted, and persistent critical enablers for delivering effects based combat power. In particular, the GWOT continues to place emphasis on the importance of UAVs. The Fiscal Year 2006 Budget request reflects our commitment to a focused array of UAVs that will support and enhance both surveillance and strike missions with persistent, distributed, netted sensors.

### Fire Scout UAV

The Fiscal Year 2006 Budget requests $77.6M to continue development of the Fire Scout UAV. The Fire Scout is a Vertical Takeoff and Landing Tactical UAV (VTUAV) designed to operate from all air-capable ships, carry modular mission payloads, and operate using the Tactical Control System and Tactical Common Data Link. The Fire Scout UAV will provide day/night real time ISR and targeting as well as communication-relay and battlefield management capabilities to support core Littoral Combat Ship (LCS) mission areas of ASW, MIW and ASUW for the naval forces. Fire Scout will include a four-bladed rotor and 500 lbs payload capacity. Fire Scout will be fielded with LCS Flt 0.

The Army has selected the Fire Scout for their Army Future Combat System Class IV UAV. Numerous similarities in hardware components, testing, logistics, training, software and support requirements, offer potential for overall program cost reduction which would clearly benefit both the Army and Navy. We expect to sign a MOA with the Army for the acquisition of the Fire Scout airframe, and selected subsystems on a single Navy contract. The airframes will be subsequently modified to Service specific requirements under separate existing Navy and Army contracts. The goal is to maximize common support opportunities, eliminate redundant costs, maximize common avionics and sensor configuration to promote interoperability, and eliminate redundant tests.

### Vertical Unmanned Air Vehicle (VUAV)

UAVs have played a critical role in recent operations and are also a key element of our transformation. The Marine Corps is pursuing the replacement of its almost 20-year-old Pioneer UAV system that has flown over 6,950 hours in support of OIF highlighting the criticality of these systems for our Marine forces. Requirements for VUAV are being developed in consonance with Ship to Objective Maneuver concepts from Expeditionary Maneuver Warfare, the naval concepts of Sea Basing and Seapower 21, and with lessons learned from recent operational experience. The Fiscal Year 2006 Budget requests $9.2M to evaluate the Eagle Eye UAV, currently being developed by the United States Coast Guard in connection with its Deepwater Program. The Department will also continue to evaluate the capabilities of Fire Scout for this mission, seeking commonality within the Department.

### Joint Unmanned Combat Air System (JUCAS)

The Fiscal Year 2006 Budget realigns funding to the Air Force to establish a Joint Program Office with Navy representation to advance the JUCAS Program. The Department is committed to a JUCAS initiative, developed in partnership with the Air Force and DARPA. The Navy and the Air Force have defined a set of capabilities, which recognize the unique needs of each

Service that will form the basis for developing air vehicles that will contribute to a joint warfighting concept of operation.

## NAVAL SURFACE FIRE SUPPORT

The heart of Naval Surface Fire Support is delivering combat power ashore from the sea. Similar to our concept of ship self-defense, any discussion about naval fire support using the lexicon of Sea Power 21 should discuss the capabilites resident in the distributed and netted maritime Force to deliver precision combat power to achieve our objectives.

### Traditional Naval Surface Fire Support

Near term fire support improvements for the Navy are centered on a triad of new programs: the Extended Range Munition (ERM), the 5"/62 Gun Weapon System, and the Naval Fires Control System (NFCS). Together these programs were intended to allow the Navy to support near term US Marine Corps Fires requirements. The ERM program provides responsive fire support to 41-63nm range with global positioning system (GPS) accuracy. The ERM munitions will be fired from the 5"/62 Mod 4 Gun Weapons System which will provide a stronger breech for ERM's higher-energy propelling charges. The current budget will field ERM capabilities in the test ship USS WINSTON CHRURCHILL (DDG 81) by Fiscal Year 2009 with additional DDGs to follow by Fiscal Year 2011. A total of 32 DDGs will be outfitted to support the ERM capability including ERM-specific projectile handling and fuse setting equipment. NFCS, which provides joint digital fire support communications, will also be fielded in these ships. The 5"/62 Mod 4 gun will also be installed in twenty-two cruisers (CGs) to capture life cycle cost savings, but these ships will not be ERM capable.

The Navy is nearing its goal of fielding this improved fire support capability, but has experienced some developmental delays with the long-range munitions that will push back the IOC to Fiscal Year 2011. In order to mitigate risk for the munitions development, the Navy will conduct an open source selection in Fiscal Year 2005 between the Extended Range Guided Munition (ERGM), the Ballistic Trajectory Extended Range Munition (BTERM II) and potential competitors. The contract will be awarded in early Fiscal Year 2006 with IOC planned for Fiscal Year 2011.

### Tactical Tomahawk (TACTOM)

The Fiscal Year 2006 Budget supports the Navy's commitment to replenish our precision-guided munitions inventories utilizing the Navy's first contract for a weapon. TACTOM entered Full Rate Production in August 2004 and the program completed the second and final remanufacture, converting all available older Tomahawk airframes to the latest Block III configuration. The Firm Fixed Price five year contract (Fiscal Years 2004 - 2008) for TACTOM saves approximately 12% over annual procurements. TACTOM's advanced design and manufacturing processes have cut procurement cost to $729K or half the cost of a Block III missile and maintenance costs by half of the cost of its predecessor. TACTOM provides a more capable missile with a 15-year product warranty and a 15-year recertification interval. This approach mitigates price growth of follow-on procurements by providing incentive for the contractor to manage for obsolescence, which will control future price growth on follow procurements.

The Navy is dedicated to developing new means by which the Joint warfighter can defeat time critical strike targets in anti-access scenarios, address counter-WMD missions, and improve our ability to fight the GWOT. Towards that end, we are working with the other Services, the Joint Chiefs of Staff, and the Combatant Commanders to begin studies that may afford opportunities

for the possible development of the next generation of affordable weapons. We envision that these weapons may allow us to employ long-range standoff weapons in direct attack roles via advanced high-speed propulsion and deployment of a variety of lethal packages.

**DD(X) Destroyer**

DD(X) is the centerpiece of a surface combatant family of ships that will deliver a broad range of capabilities. It is already providing the baseline for spiral development of technology and engineering to support a range of future ship classes such as CG(X), LHA(R) and CVN 21. This advanced multi-mission destroyer will bring revolutionary improvements to precise time-critical strike and joint fires for our Expeditionary Strike Groups of the future. It expands the NSFS battle-space by over 400%; has the radar cross section of a fishing boat; and is designed to be as quiet as a LOS ANGELES Class submarine. DD(X) will also enable the transformation of our operations ashore. Its on-demand, persistent, time-critical strike capability revolutionizes our joint fire support and ground maneuver concepts of operation so that our strike fighter aircraft are freed for more difficult targets at greater ranges. DD(X) will provide credible forward presence while operating independently or as an integral part of naval, joint, or combined expeditionary forces.

The Fiscal Year 2006 Budget request includes $1.1B in RDT&E for continued technology development and $716M in SCN advance procurement funds for the first and second DD(X). DD(X) will dramatically improve naval surface fire support capabilities available for joint and coalition forces. Planned technologies, such as an integrated power system and total ship computing environment in an open architecture, will provide more affordable future ship classes in terms of both construction and operation. DD(X) will be the first forward-fit surface combatant with an open architecture combat system. This investment will be leveraged to other surface ship procurements, including CVN 21 and LHA(R).

The FYDP includes full funding for the first DD(X) in Fiscal Year 2007 and construction of one ship per year in each follow on year. DD(X) will provide the hull form and propulsion for the future generation of surface combatants that provide an array of 21$^{st}$ Century Naval capabilities.

Long Range Land Attack Projectile (LRLAP) is an integral part of the Advanced Gun System (AGS) Engineering Development Model of the DD(X) program. AGS was started in Fiscal Year 1999 and is scheduled for delivery in 2008 with IOC in 2013 in conjunction with DD(X) Hull 1. LRLAP is a 155mm (6.1") round. In the far-term, DD(X) is expected to reach IOC in 2013. Equipped with the AGS LRLAP, a rocket propelled, GPS guided 155mm round with a unitary warhead, DD(X) will provide precision and volume fires up to 100nm inland to support of forces ashore. Testing is in progress on both the AGS and LRLAP. LRLAP has completed two test flights, achieving guided flights, off Pt. Mugu, CA.

**SSGN**

As a convert, non-provocative, multi-mission platform, the SSGN brings a significant increase in strike capability. SSGN leverages from the established and proven OHIO Class maintenance and training infrastructure and two-crew concept to maximize forward deployed war-fighting capability. The Fiscal Year 2006 Budget requests $287M of procurement funding for the conversion of the fourth and final submarine to be converted to SSGN. Upon completion, SSGN will provide transformational war-fighting capability carrying up to 154 Tomahawk cruise

missiles and support deployed special operating forces. The four SSGN conversions are being executed utilizing a public-private partnership conducting the work in Naval Shipyards. The USS OHIO (SSGN 726) will complete her shipyard availability in November 2005 and the program is on track to IOC in the summer of 2007. All four SSGNs are scheduled to deliver by the end of Fiscal Year 2007.

**Fire Support Enablers: C4ISR and Space Programs**

The DON's command, control, communications and computer (C4) programs provide the information infrastructure that permits this integration, and, by making connections to the Global Information Grid programs of other Services and Defense Agencies, integrates naval forces into the joint forces operated by combatant commanders. We are also building a strong partnership with the Air Force to deliver joint and interoperable capabilities in the Joint Tactical Radio System (JTRS) family, Deployable Joint Command and Control System (DJC2) and DCGS programs

Our intelligence, surveillance, and reconnaissance (ISR) programs, provide the naval and joint forces with the information superiority that allows the precise and effective application of these forces. The DON's information operations programs help maintain that information superiority by protecting our own C4ISR capabilities while degrading those of our adversaries.

The President's Budget request for Fiscal Year 2006 includes joint acquisition programs to develop and field interoperable C4I capabilities for the war-fighter. In 2005 the first suite of the DJC2 is slated to become operational and provide an innovative set of C4I solutions urgently needed in today's operational environment. The Navy also heads the Mobile User Objective System communications satellite program that will provide enhanced bandwidth and other needed space-based capabilities beginning in 2010.

**Joint Tactical Radio System (JTRS)**

We are working with the Air Force to successfully converge development of Navy and Air Force versions of JTRS (JTRS-AMF) to provide a common acquisition approach. Closely coupled with the JTRS Program and building on the initial Multi-functional Information Distribution System (MIDS), we have developed a promising joint effort with the Air Force that will significantly improve interoperability to the cockpit and maintain alignment with our tactical radio transition to the JTRS environment. This effort also has four international partners who are paying participants in the program.

**Mobile User Operating System (MUOS)**

The Department remains a strong participant in the National Security Space Program with our new start MUOS UHF Satellite Program that exhibits all the capabilities needed to ensure compliance with the DoD Net-centric models and regulations. Our SPAWAR Space Field Activity that supports the National Reconnaissance Office (NRO) is strong and very effective in identifying collaborative opportunities for Navy-NRO partnerships.

**Distributed Common Ground System – Navy (DCGS-N)**

A further step forward in network-centric warfare and one of the Navy's transformational initiatives is DCGS-N. In January 2004, the Navy combined the Joint Service Imagery Processing System – Navy with the Joint Fires Network into DCGS-N. These programs were combined organizationally, programmatically, and technically. The Fiscal Year 2006 Budget request includes $12.4M for continued DCGS-N development. This capability merges ISR, targeting and command and control systems into a coherent architecture to improve situational awareness, fires and time-sensitive targeting. It serves as a building block for the Navy's more extensive FORCEnet concept.

**Non-Traditional Fire Support**

Sea Power 21 will provide precise and persistent combat capabilities that will ensure access to the maritime maneuver space and project power over land. New force packaging concepts will be used to increase operation tempo and reach from fires from the distributed and netted force.

**Precision Guided Munitions (PGM)**

The U.S. Navy weapons programs of the 21st Century are evolving to address the challenges of a dynamic and unpredictable enemy. New weapon systems are planned or have been developed and delivered to the Combatant Commanders to provide new options to engage enemy forces in support of the GWOT. The Navy's Fiscal Year 2006 Budget supports PGM programs that continue to allow domination of the maritime environment, support in-land operational forces, and enhance the overall department strategy to deter and dissuade potential adversaries while supporting our allies and friends.

**Joint Direct Attack Munitions (JDAM)**

JDAM has been the Department's weapon of choice for OEF/OIF. In October 2004, the U.S. Navy provided an Early Operational Capability and accelerated deliveries for a 500 lb JDAM variant (GBU-38) for Navy F/A-18 A+/C/D platforms. After approving production of this variant, we immediately deployed it in order to meet an urgent warfighter need to employ precision munitions with limited collateral effects in the congested urban environments of Iraq. The Fiscal Year 2006 Budget request of $82.6M procures 3,400 DON JDAM tail kits for all variants, thus supporting all current and projected warfighter requirements. The Fiscal Year 2006 Budget reduces procurements to 1,500 kits per year starting in Fiscal Year 2008; however, the Department will closely monitor all JDAM variant requirements and combat expenditures in order to make any necessary adjustments.

**Joint Standoff Weapon (JSOW)**

A new variant of the JSOW called JSOW-C was approved for Full Rate Production in December 2004. Similar to the new 500 lb JDAM program, this capability is in demand by the warfighter to provide new options for precision attack against point targets vulnerable to blast fragmentation effects and hardened targets. The new JSOW-C variant employs an augmenting charge with a follow-through penetrator bomb for hard targets that can also be set to explode both warheads simultaneously. This lethal package is coupled with an Imaging Infrared Seeker and GPS/INS to provide the standoff precision attack capability in demand by the warfighter. The Fiscal Year 2006 Budget fully funds JSOW-C production and support. It also shifts funding from production of a submunition variant of JSOW to all JSOW-C's until there is resolution of unexploded battlefield ordnance issues that are of concern to the Department and our allies. The

Navy/contractor JSOW Team is dedicated to reducing acquisition costs. Specifically, we are expecting to achieve a unit cost reduction of more than 25% by 2006 due to the implementation of lean initiatives, innovative processes, and engineering changes.

**Advanced Anti-Radiation Guided Missile (AARGM)**

The Fiscal Year 2006 Budget request continues the development of a next generation Destruction of Enemy Air Defense weapon system, the AARGM. AARGM ensures continued air dominance and multi-mission flexibility to the F/A-18 and EA-18 aircraft across suppression and defeat of enemy air defenses, strike, and electronic warfare missions. The Department recently entered into international partnership negotiations with our NATO partner Italy, and we plan an Initial Operating Capability for F/A-18 C/D during Fiscal Year 2009. Prototype AARGM seekers are currently undergoing Lab, Field, captive flight-testing and are meeting test objectives. The Critical Design Review for the AARGM system will complete in Fiscal Yea 2006. The Navy is dedicated to developing new means by which the Joint warfighter can defeat time critical strike targets in anti-access scenarios, address counter-WMD missions, and improve our ability to fight the GWOT. Towards that end, we are working with the other Services, the Joint Chiefs of Staff, and the Combatant Commanders to begin studies that may afford opportunities for the possible development of the next generation of affordable weapons. We envision that these weapons may allow us to employ long-range standoff weapons in direct attack roles via advanced high-speed propulsion and deployment of a variety of lethal packages.

**Air Delivered Fire Support**

Delivering combat power ashore to defeat time critical targets in anti-access scenarios is a key enabler for seizing the initiative and swiftly defeating the threat. The distributed and netted maritime force will deliver precision fires from the air.

**F/A-18 E/F**

The F/A-18E/F continues to transition into the fleet, improving the survivability and strike capability of the carrier air wing. The Super Hornet provides a 40 percent increase in combat radius, 50 percent increase in endurance, and 25 percent increase in weapons payload over our older Hornets. Over 300 F/A-18E/Fs have been procured through Fiscal Year 2005, on track to complete procurement of the program of record 462 aircraft in 2011. The Fiscal Year 2006 Budget requests $2.82B for 38 F/A-18 E/F aircraft for the second year of the five-year MYP contract (Fiscal Year 2005 to 2009). The Super Hornet has used a spiral development approach to incorporate new technologies, such as the Joint Helmet Mounted Cueing System, Advanced Targeting FLIR, Shared Reconnaissance Pod System and Multifunctional Information Distribution System data link. The first Low Rate Initial Production Advanced Electronically Scanned Antenna Radar system has been delivered to Boeing for installation into an F/A-18 and will undergo operational testing in 2006.

**F-35 Joint Strike Fighter (JSF)**

Our recapitalization plan includes the JSF, a stealthy, multi-role fighter aircraft designed jointly to be an enabler for Naval Power 21. The Fiscal Year 2006 Budget request contains $2.4B for continuation of System Development and Demonstration on the JSF. The JSF will enhance the DON's precision strike capability with unprecedented stealth, range, sensor fusion, improved radar performance, combat identification and electronic attack capabilities compared to legacy

platforms. The carrier variant (CV) JSF complements the F/A-18E/F and EA-18G in providing long-range strike capability and much improved persistence over the battlefield. The short takeoff and vertical landing (STOVL) JSF combines the multi-role versatility of the F/A-18 and the basing flexibility of the AV-8B. The commonality designed into the JSF program will reduce acquisition and operating costs of Navy and Marine Corps tactical aircraft and allow enhanced interoperability with our Allies and sister Services.

The JSF has completed the third year of its development program, and the program continues working to translate concept designs to three producible variants. Manufacture/assembly of the first flight test aircraft conventional takeoff and landing (CTOL) is underway and roughly 40% complete, with assembly times much less than planned. Two thousand engine test hours have been completed through mid-January 2005. Detailed design work continues for the CTOL and STOVL variants. First flight is scheduled for 2006. The JSF program has aggressively addressed the performance issues associated with weight and airframe design. The STOVL variant weight has been reduced by 2500 lbs. through design optimization. Installed thrust improvements and aerodynamic drag reduction as well as requirements tailoring are being incorporated to further improve aerodynamic performance. All three variants are projected to meet Key Performance Parameter requirements.

The JSF program is completing a replan effort that began approximately a year ago. The software block plan and test plan are being reviewed consistent with the revised schedule and Service needs. The Fiscal Year 2006 Budget reflects the revised System Development and Demonstration and production schedule.

**F/A-18 A/B/C/D**

The Fiscal Year 2006 Budget request contains $422.4M for the continuation of the systems upgrade programs for F/A-18 platform. As the F/A-18 program transitions to the F/A-18E/F, the existing inventory of over 900 F/A-18A/B/C/Ds will continue to comprise half of the Carrier Strike Group until 2012. Included in this request is the continued procurement of recently fielded systems such as Joint Helmet Mounted Cueing System, Advanced Targeting FLIR, Multi-Function Information Distribution System, and Digital Communications System. The Marine Corps continues to upgrade 76 Lot 7-11 F/A-18A and C to Lot 17 F/A-18C aircraft capability with digital communications and tactical data link. The Marine Corps anticipates programmed upgrades to enhance the current capabilities of the F/A-18C/D with digital communications, tactical data link and tactical reconnaissance systems. This upgrade ensures that our F/A-18s remain viable and relevant in support of Tactical Air Integration and Expeditionary Maneuver Warfare. The Marines expect the F/A-18A+ to remain in the active inventory until 2015. The Marines are also employing the LITENING targeting pod on the F/A-18A+ and D aircraft in OIF. When combined with data link hardware, the LITENING pod provides real time video to ground forces engaged with the enemy. The capabilities of the LITENING pod with data link are highly effective for Marine Corps expeditionary F/A-18 operations. The Fiscal Year 2006 Budget request also includes procurement of Center Barrel Replacements to extend service life of F/A-18A/C/Ds seven years to meet fleet inventory requirements until 2022.

**AH-1Z / UH-1Y**

The H-1 Upgrades Program will remanufacture 180 AH-1W and 100 UH-1N helicopters into state-of-the-art AH-1Z and UH-1Y models. The Fiscal Year 2006 Budget requests $307.5M APN funds to procure 10 UH-1Y/AH-1Z aircraft and $42.0M RDT&E funds to complete the H-1 Upgrades Engineering and Manufacturing Development phase. The development program is over 90 percent complete with five aircraft being readied for OPEVAL, which will begin this summer. Work on the first LRIP lot, awarded to Bell Helicopter in December 2003, is progressing well and the second LRIP lot will be awarded by the end of March 2005. The program is seeking opportunities to reduce unit cost and minimize the negative impact the remanufacture strategy could have on ongoing military operations. Regarding the latter point, we anticipate that some number of airframes will be newly fabricated instead of remanufactured in order to reduce the amount of time aircraft would otherwise be out of service. The optimum mix of remanufactured and newly fabricated aircraft is being evaluated with the results to be reflected in future budget requests. The H-1 Upgrade Program is a key modernization effort designed to resolve existing safety deficiencies, enhance operational effectiveness of both the AH-1W and the UH-1N, and extend the service life of both aircraft. The program will provide 100 UH-1Ys and 180 AH-1Zs with 10,000 hour airframes. Additionally, the commonality gained between the AH-1Z and UH-1Y (84 percent) will significantly reduce life-cycle costs and logistical footprint, while increasing the maintainability and deployability of both aircraft.

**AV-8B**

The Fiscal Year 2006 Budget requests $15.5M RDT&E funds to support development of the Engine Life Management Plan (ELMP)/Accelerated Simulated Mission Endurance Testing, Tactical Moving Map Display, and Aircraft Handling initiatives. The Fiscal Year 2006 Budget also requests $36.6M procurement funding for Production Line Transition efforts, procurement of Open Systems Core Avionics Requirement, ELMP upgrades, and the Readiness Management Plan which addresses aircraft obsolescence and deficiency issues associated with sustaining the AV-8B until JSF transition.

**EA-6B**

The Fiscal Year 2006 Budget request of $120.6M reflects the total budget for wing center section modifications and procurement of three Improved Capability (ICAP) III systems. The aging EA-6B has been in ever-increasing demand as DoD's only tactical radar jamming aircraft that also engages in communications jamming and information operations. EA-6B operational tempo has continued at extremely high levels during the past year. Safety considerations, due to wing center section and outer wing panel fatigue, have reduced aircraft available to the fleet from 95 to 85. Aircraft inventory is projected to return to above 95 by the end of Fiscal Year 2005. Program priorities are current readiness and successful fleet introduction of the ICAP III selective reactive jamming system.

**EA-18G**

The E/A-18G continues development as the Navy's replacement for the EA-6B Airborne Electronic Attack (AEA) aircraft. The Navy is using the F/A-18E/F multi-year contract to buy four Systems Design and Development aircraft in Fiscal Year 2006 to install and integrate Northrop Grumman's in-production Improved Capabilities (ICAP)-III AEA system. These aircraft will support EA-18G operational testing and allow the department to deliver the next

generation (AEA) capability at reduced cost and in the shortest possible timeframe. The Marine Corps initiated studies to examine options for replacing their electronic attack aircraft. The Fiscal Year 2006 Budget request reflects $409M for Systems Design and Development. The Systems Design and Development continues on schedule with construction underway of the two development aircraft. First flight is scheduled for the fourth quarter of Fiscal Year 2006. A total quantity of 30 systems will be procured in LRIP with a planned Fiscal Year 2009 IOC and Fiscal Year 2012 FOC. The EA-18G will replace carrier-based Navy EA-6B aircraft by 2012.

## ROLE OF EXPERIMENTATION IN DEVELOPING CRITICAL ENABLERS

**Sea Trial** is the Navy's recently created process for formulating and testing innovative operational concepts, most of which harness advanced technologies and are often combined with new organizational configurations, in pursuit of dramatic improvements in warfighting effectiveness. Sea Trial concept development and experimentation (CD&E) is being conducted in close coordination with, the Marine Corps combat/force development process and reflects a sustained commitment to innovation. These efforts tie warfare innovation to the core operational challenges facing the future joint force.

As a means of accelerating our investment in Sea Power 21, we employ the Naval Capability Development Process (NCDP) and Expeditionary Force Development System (EFDS). The NCDP and EFDS take a concepts-to-capabilities approach to direct investment to achieve future warfighting wholeness. The NCDP takes a sea-based, offensive approach that provides power projection and access with distributed and networked forces featuring unmanned and off-board nodes with penetrating surveillance via pervasive sensing and displaying that rapidly deliver precision effects. The EFDS assesses, analyzes and integrates MAGTF warfighting concepts, and requirements in a Naval and joint context to support the overarching operational concept of Joint Seabasing. Both processes are designed to incorporate innovative products of Service and Joint CD&E and Science and Technology (S&T) efforts.

Identifying and developing future capabilities for naval forces will require robust experimentation involving systems, platforms, organizations, and tactics. The Navy's Sea Trial and Marine's Sea Viking experimentation elements of our Sea Power 21 strategy give the Fleet a strong voice in evaluating the potential of new technologies and warfighting concepts. Extensive use of simulations, modeling, joint test facilities, and actual forces is necessary to maintain our technical advantage and continual command of the seas. The Sea Viking 04 wargame recently conducted by Joint Forces Command examined many of the issues surrounding Forced Entry operations from a coalition Sea Base. Sea Viking 06 is the next experimentation platform that is developing Distributed Operations and will be using or simulating many of the technologies and systems we are discussing today.

Silent Hammer, a Sea Trial experiment conducted off the coast of San Diego from October 4 to 14, 2004, provided a timely opportunity to demonstrate recently developed Joint Warfare capabilities. Silent Hammer demonstrated how a networked force, including sea-based SOF from an SSGN, can fill joint gaps – Intelligence, Surveillance, and Reconnaissance (ISR) and Time Sensitive Strike – by conducting large-scale clandestine operations with Special Operating Forces (SOF), supported by advanced unmanned systems, to reduce risk and increase capability. Silent Hammer explored our ability within a tactical scenario to develop persistent ISR using National Sensor information, Space Based Radar with ground target-motion detection, UAV video, a network of unattended ground sensors, advanced ship sensors, and information operations to synthesize the most comprehensive and effective tactical picture available to support the war fighter. USS GEORGIA (SSGN 729) served as Silent Hammer's clandestine sea-base platform, providing the headquarters node from which command and control operations and logistic support were conducted with the first time submarine embarked Joint Force Commander.

In October/November 2004, the most aggressive anti-submarine warfare (ASW) exercise of the year was conducted in the Western Pacific. The experiment employed capabilities currently employed or anticipated in the Pacific AOR and had near-term as well as mid-term implications.

The experiment evaluated the ability to achieve access from pre-hostilities through conflict in a hostile ASW environment using a network centric ASW construct. The specific initiatives of the experiment were (1) examine the value of battle space preparation (covert peacetime operations) and pre-, post-hostility ASW operations within a theater context; (2) test wide area search and cueing systems; (3) test the ability to maintain situational awareness of diesel submarines in challenging and operationally relevant environments with a netted force; and (4) reduce the sensor to shooter timeline and keep adversary diesel submarines from threatening friendly high value units. The capability assessment enabled by this experiment will be used in the preparation of next year's budget.

**Experimental Craft (X-Craft)**

The X-Craft will help evaluate and validate emerging ship technologies. The end results will be risk reduction in ship acquisition programs based on specific well-defined Navy operational requirements as well as lessons learned from the employment of the spiral development drive prototypes. These efforts are directly related to the development of LCS characteristics. They provide the opportunity to analyze unique characteristics and technologies that can contribute to the development of LCS characteristics and Concepts of Operation. Additionally, there are some aspects of the X-craft design that apply to both LCS and DD(X). Most notable are the Night Vision Goggle-compatible flight deck lighting suite and human system interfaces that support efficient operations with an optimally manned core crew.

Two prototypes of Unmanned Sea Surface Vessel (USSV) are under construction for testing in 2005. This testing will demonstrate new technologies (e.g., launch and retrieval systems) being used in the design of the unmanned vessel, and to generate lessons learned. Although there is no current developmental plan for Unmanned Underwater Vehicle (UUV) testing, ONR is reviewing the potential for using UUV with the current X-Craft on-board retrieval system. This review could provide a solution for a common UUV/USSV launch and retrieval system. Additionally, it will allow us to determine the vessel’s performance envelope and how we can optimize speed, payload, range, and seakeeping characteristics as we further develop USSV.

Additionally, this unmanned craft will demonstrate an automated launch and retrieval system for other USVs. The project’s relevance is in the fields of Mine Warfare, Anti-submarine Warfare, Anti-Terrorism/Force Protection, and Intelligence, Surveillance & Reconnaissance.

## SUMMARY

Our mission remains bringing the fight to our enemies. To be successful, we have to be aware of the current and potential changes to the operating environment. The increasing dependence of our world on the seas, coupled with growing uncertainty of other nations' ability or desire to ensure access in a future conflict, will continue to drive the need for Naval forces and the capability to project decisive joint power by access through the seas. The increased emphasis on the littorals and the global nature of the terrorist threat will demand the ability to strike where and when required, with the maritime domain serving as the key enabler for U.S. military forces. Anti-Submarine Warfare, Mine Countermeasures, Ship Self-Defense and Naval Surface Fire Support are critical capabilities for ensuring access and successfully executing our overall strategy.

Accordingly, we will execute the GWOT while transforming for the future fight. We will continue to refine our operational concepts and appropriate technology investments to deliver the kind of dominant maritime power envisioned in Sea Power *21*. We will continue to pursue the operational concepts to deliver persistent combat power, even as we invest in technology and systems to enable joint and maritime forces to deliver decisive, effects-based combat power in every tactical and operational dimension. We look forward to continuing our strong partnership with this prescient sub-committee, who has helped prepare the Navy and Marine Corps Team for the many successes we enjoy today and will work with you to deliver an even more capable force in the future. We thank you for your consideration.